LEGEND

EDGE OF KERB
OVERHEAD ELECTRICITY
BUILDING WALL
CROWN OF BITUMEN
FENCE LINES
PROPERTY BOUNDARY
STORMWATER
SEWER MAIN

WATER VALVE/METER
FIRE HYDRANT
TELSTRA PIT
ELECTRICITY PIT/POLE
SURVEY MARKS
STORMWATER MH/GRATE
SEWER MH

Notes:

- This plan is prepared for the client from a combination of field survey and existing records for the purpose as instructed by the client and should not be used for any other purpose.
- The title boundaries shown hereon were not marked by the author at the time of survey and have been determined by plan dimension only and not by field measurement.
- Services shown hereon have been located where possible by field survey. If not able to be located known services have been plotted from the records of relevant authorities where available and have been noted accordingly on this plan. Where such records do not exist or are considered inadequate, a notation has been made hereon.
- Contours depicted are surveyed ground levels and may not represent Ground Level as defined by the planning scheme for the overall determination of height.
- Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services. This note is an integral part of this plan.

CLOVERDALE ROAD

101 RP 90234
102 RP 90234
103 RP 90234
105 SP 235699

Edge of Bitumen
Centreline of Road
Benchmark Bitumen 23.634
Conc D/Way
Gate
Vegetation
Change of Grade
PP #33.448
Bitumen D/Way
House
Shed
Concrete Ret Wall
Conc Slab
Building Pads
Open Drain
Sew MH SL24.05
Sew Septic MH SL22.33
SW MH SL21.81
Sew MH SL20.64
Sew MH SL20.06
SW Grate SL20.56
IL20.66
IL19.59
IL18.87
IL18.69
IL18.10
IL17.62
IL19.03
225 Dia
300 RCP
600 Dia

Alex Wu

SCALE 1 : 800 A3
0 8m 16m 24m 32m 40m

terramap
CONSULTING CADASTRAL & ENGINEERING SURVEYORS
Unit 12, 178-182 Redland Bay Road
Capalaba, QLD 4157
www.terramap.com.au
Ph 32451611 Fax 32451944
reception@terramap.com.au

SURVEYOR:	RS & NM
DATE OF SURVEY:	04.09.15 & 20.01.2016
CONTOUR INTERVAL:	0.25m
LEVEL DATUM:	AHD DERIVED
ORIGIN:	PSM 186215 RL20.590
MERIDIAN:	RP 90234

Contour and Detail Survey
Lots 99-103 on RP 90234
18-32 Cloverdale Road, Doolandella
Sheet 1 of 3

Rev	DATE	By	AMENDMENT
5	17/03/22	JO	Survey Extended
4	20/12/21	RK	Datum changed to MGA2020
3	15/5/17	AS	Survey Extended
2	21/10/16	AS	Sewer IL added
1	20.01.16	GJW	ORIGINAL ISSUE
0	14.09.15	BG	ORIGINAL ISSUE

DRAWN: 20.01.2016
CHECKED: 20.01.2016
APPROVED: 20.01.2016
DRAWING NUMBER: 3814/002-1
REV: 5

APPENDIX

B

Intrax, Proposed Reconfiguration (Ref: S152485)

REV.	AMENDMENT	DATE
C-3	WIDENING OF EASEMENT	15/02/2022
C-4	ALTERATION OF BUSH LOT FRONTAGE	05/05/2022
C-5	REALIGNMENT OF POTENTIAL ACTIVE TRANSPORT ROUTE	05/07/2022
D-1	REDESIGN	5/6/2023

Intrax
Ground Floor D2, 643 Kessels Rd,
Upper Mt Gravatt QLD 4122
Ph: 1300 MYINTRAX (1300 469 728)
reception@intrax.com.au
www.intrax.com.au
Intrax Consulting Group
VIC | NSW | SA | QLD

PROPOSED RECONFIGURATION OF LOT APPLICATION OVER

LOTS 101-103 ON RP90234
12, 18 & 26 CLOVERDALE ROAD
LOCALITY OF DOOLANDELLA LOCAL AUTHORITY OF BRISBANE C.C.

This plan was prepared as a proposed subdivision and should not be used for any other purpose. The dimensions,areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular,no reliance should be placed on the information on this plan for any financial dealings involving the land. This note is an integral part of this plan.

HORIZONTAL DATUM:	MGA, Zone 56
VERTICAL DATUM:	AHD
ORIGIN:	3814002-1
CONTOUR INTERVAL:	0.25 m

SCALE:	1:400
DATE:	5/6/2023
SHEET NO.	2 OF 2
REVISION:	(D-1)
DRAWN:	Stanfield's
CHECKED:	
APPROVED:	
SURVEYED:	

S152485

D

A1

Scale 1: 400 @ A1 – Lengths are in Metres.
Scale 1: 800 @ A3 – Lengths are in Metres.

LEGEND

- PP — Denotes Power Pole
- Denotes Development Boundary
- Denotes Existing Lot Boundaries
- Denotes Option for Future Bikeway
- Denotes Watercourse
- Denotes Drainage Easement
- Denotes Access Easement
- Denotes Overland Flow Flooding Easement
- Denotes Creek Flooding Easement
- Denotes Covenant
- Denotes Building Envelope
- Denotes Garage Built to Boundary
- Denotes New Road
- Denotes Existing Road
- Denotes Drainage Reserve
- Denotes Bio-retention Basin
- Denotes Detached House Lots (35 Dwellings)
- Denotes Environmental Protection Zone (1 Dwelling)

(36 Dwellings Total)

SHEET 2

SHEET 1

Scale 1: 750 @ A1 — Lengths are in Metres.

5 0 5 10 20 30 40 50 60 70 80 90 100 110

Scale 1: 1500 @ A3 — Lengths are in Metres.

10 0 20 40 60 80 100 120 140 160 180 200 220

REV.	AMENDMENT	DATE
C-3	WIDENING OF EASEMENT	15/02/2022
C-4	ALTERATION OF BUSH LOT FRONTAGE	05/05/2022
C-5	REALIGNMENT OF POTENTIAL ACTIVE TRANSPORT ROUTE	05/07/2022
D-1	REDESIGN	05/06/2023

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PROPOSED RECONFIGURATION OF LOT APPLICATION OVER

LOTS 101-103 ON RP90234

12, 18 & 26 CLOVERDALE ROAD

LOCALITY OF DOOLANDELLA LOCAL AUTHORITY OF BRISBANE C.C.

HORIZONTAL DATUM:	MGA, Zone 56
VERTICAL DATUM:	AHD
ORIGIN:	3814002-1
CONTOUR INTERVAL:	0.25 m

SCALE:	1:750
DATE:	5/06/2023
SHEET NO.	1 OF 2
	S152485

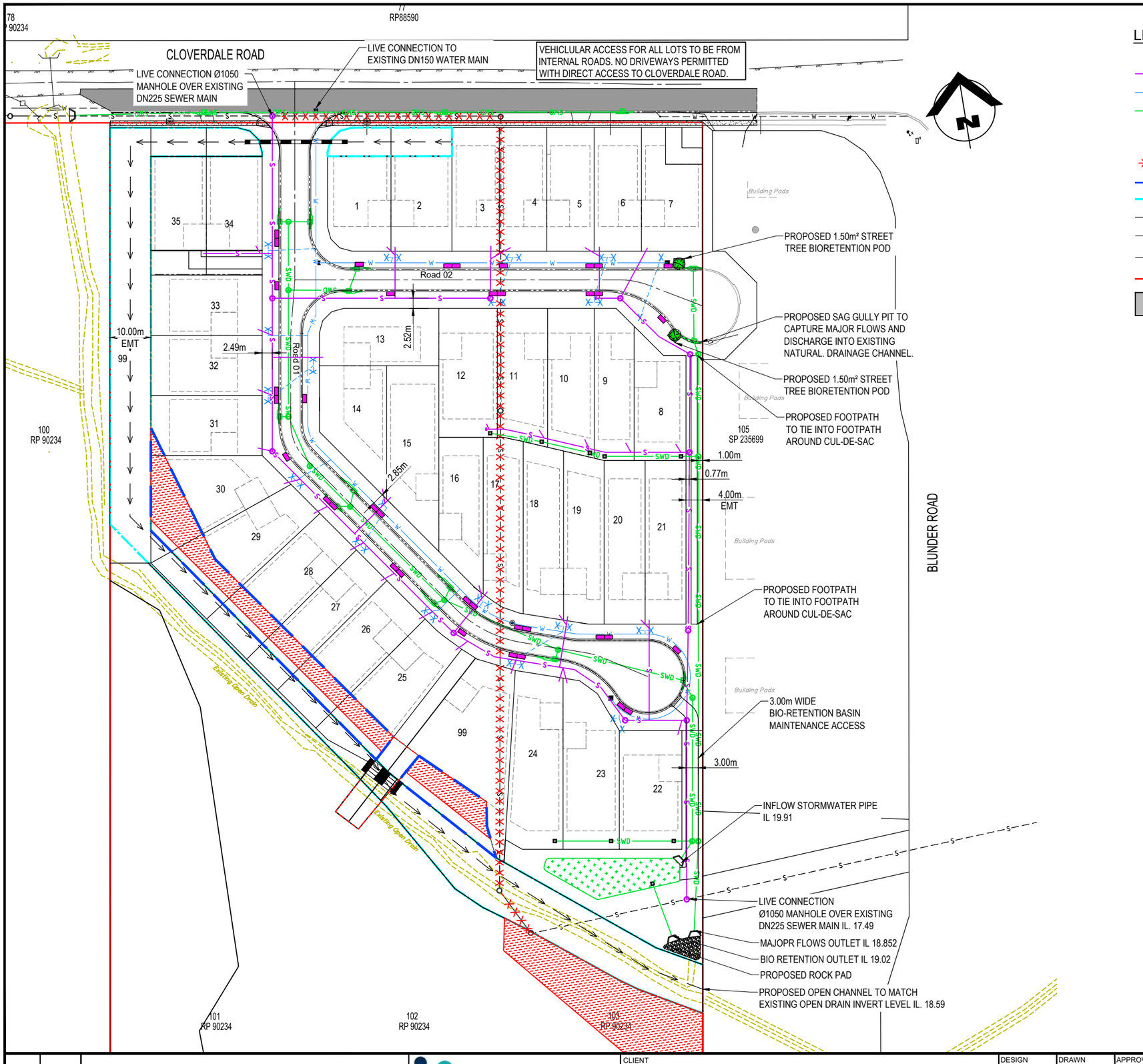
SURVEYED:	
DRAWN:	Stanfield's
CHECKED:	
APPROVED:	
REVISION:	(D-1)

D A1

APPENDIX

C

OSKA Consulting Group, Civil Services Concept Plan (Ref: OSK3426/P010/B)



LEGEND

- PROPOSED SEWER MAIN
- PROPOSED POTABLE WATER MAIN
- PROPOSED STORMWATER PIPE
- WATER PROPERTY SERVICE CONDUIT AND CONNECTION
- EXISTING 225 SEWER TO BE REMOVED
- PROPOSED COVENANT AREA
- PROPOSED OVERLAND FLOW EASEMENT
- PROPOSED INVERT OF KERB
- EXISTING 225 SEWER MAIN
- EXISTING 150 WATER MAIN
- SITE BOUNDARY
- PROPOSED PAVEMENT WIDENING
- INDICATIVE BIN PAD LOCATIONS (2m x 1m)

BCC DS
Plans/Documents RECEIVED
08/06/2023
APPLICATION REF
A006067610,

CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REPORT ISSUE
NOT FOR CONSTRUCTION

ISSUE No.	DATE	AMENDMENT
B	18-05-23	ISSUED FOR REPORT
A	10-05-22	ISSUED FOR REPORT

OSKA CONSULTING GROUP

CLIENT: QLD INTERNATIONAL INVESTMENT PTY LTD
PROJECT: PROPOSED RESIDENTIAL SUBDIVISION 12,18 & 26 CLOVERDALE ROAD DOOLANDELLA

DESIGN	DRAWN	APPROVED
JV	JV	AP

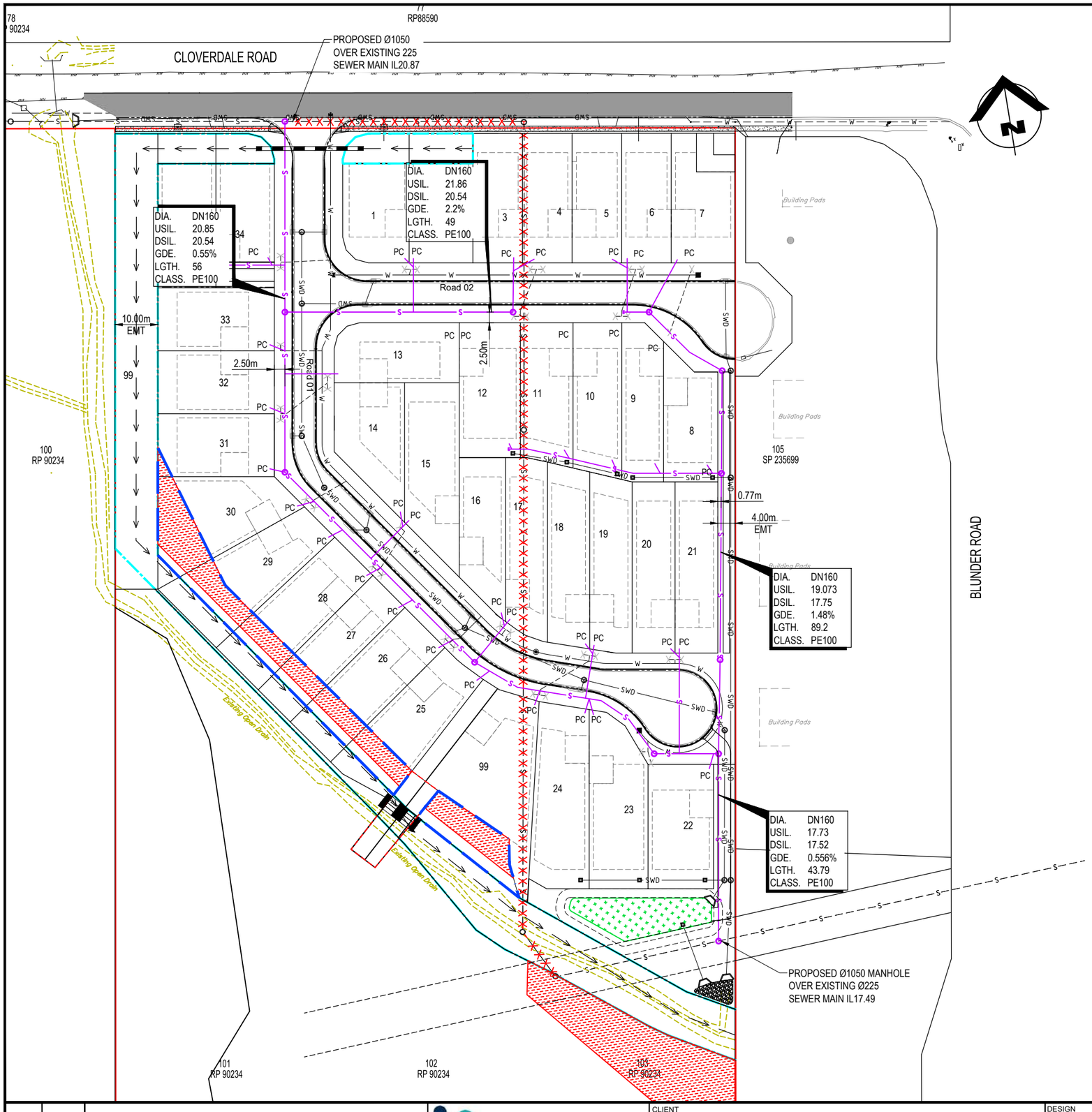
TITLE: CIVIL SERVICES CONCEPT PLAN
SCALE: 1:500 AT A1, 1:1000 AT A3 (0 10 20 30 40 50m)

PROJECT NO. OSK3426
DWG NO. P010
ISSUE B

APPENDIX

D

OSKA Consulting Group;
Sewer Concept Plan (Ref: OSK3426/P011/B);



SEWER RETICULATION LEGEND

- PROPOSED SEWER MAIN DN160 PE100 & PROPERTY CONNECTION BRANCH DN110 PE100
- EXISTING 225 SEWER MAIN
- PROPOSED SEWER MAINTENANCE HOLE
- EXISTING SEWER MAINTENANCE HOLE
- PROPOSED POTABLE WATER MAIN
- PROPOSED STORMWATER PIPE
- FINISHED SURFACE CONTOURS
- EXISTING SURFACE CONTOURS
- EXISTING 225 SEWER TO BE REMOVED
- PROPOSED 12.0m COVENANT AREA
- PROPOSED 20.0m EASEMENT
- SITE BOUNDARY

BCC DS

Plans/Documents RECEIVED

08/06/2023

APPLICATION REF

A006067610,

CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REPORT ISSUE

NOT FOR CONSTRUCTION

ISSUE No.	DATE	AMENDMENT
B	18-05-23	ISSUED FOR REPORT
A	10-05-22	ISSUED FOR REPORT

OSKA CONSULTING GROUP

CLIENT: QLD INTERNATIONAL INVESTMENT PTY LTD

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION
12,18 & 26 CLOVERDALE ROAD
DOOLANDELLA

DESIGN	DRAWN	APPROVED
JV	JV	AP

TITLE: SEWER CONCEPT PLAN

SCALE: 1:500 AT A1, 1:1000 AT A3 (0 10 20 30 40 50m)

PROJECT NO.: OSK3426

DWG NO.: P011

ISSUE: B

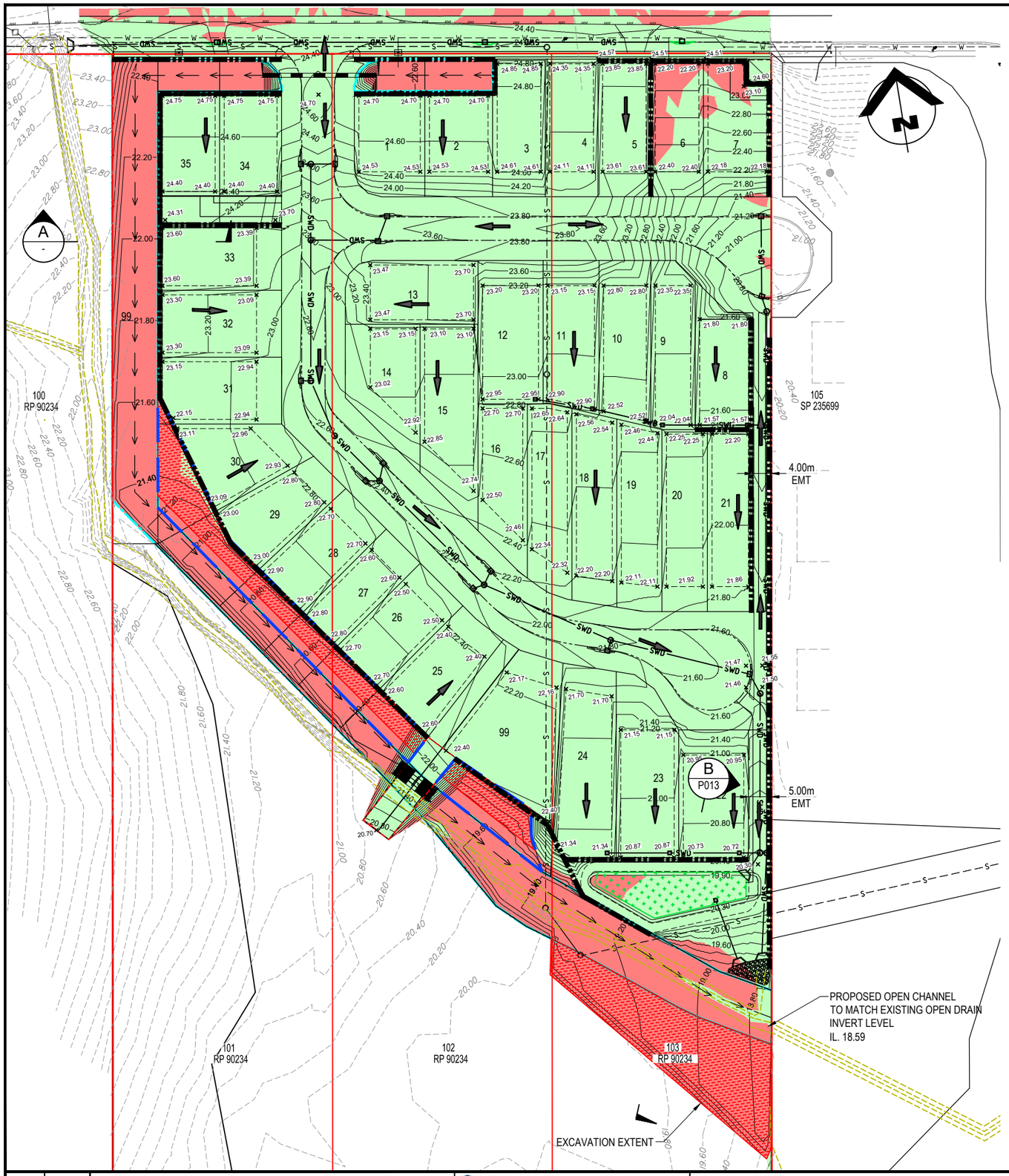
APPENDIX

E

OSKA Consulting Group, Earthworks Concept Plan (Ref: OSK3426/P012/C)

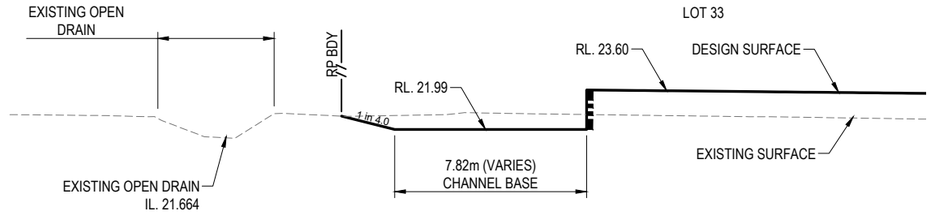
&

OSKA Consulting Group, Typical Bio Section (Ref: OSK3426/P013/C)



BULK EARTHWORKS LEGEND

- AREA OF CUT (TO FINISHED SURFACE)
- AREA OF FILL (TO FINISHED SURFACE)
- 80.0 — FINISHED SURFACE CONTOURS
- 80.0 — EXISTING SURFACE CONTOURS
- PROPOSED RETAINING WALL
- SITE BOUNDARY
- PROPOSED 12.0m COVENANT AREA
- PROPOSED 20.0m EASEMENT
- PROPOSED INVERT OF KERB
- × 0.000 — PROPOSED LEVEL
- PROPOSED FLOW DIRECTION



SECTION A
1:125 AT A1

1:125 AT A1
1:250 AT A3
0 5 10m

BULK EARTHWORKS VOLUMES	
ITEM	VOLUME (m³)
CUT	2,280
FILL	30,152
BALANCE	(27,872)

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Plans/Documents RECEIVED
08/06/2023
APPLICATION REF
A006067610,

CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

PRELIMINARY ISSUE
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ISSUE No.	DATE	AMENDMENT
C	18-05-23	ISSUED FOR REPORT
B	24-04-23	ISSUED FOR INFORMATION
A	10-05-22	ISSUED FOR REPORT

OSKA CONSULTING GROUP

CLIENT: QLD INTERNATIONAL INVESTMENT PTY LTD

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION
12,18 & 26 CLOVERDALE ROAD
DOOLANDELLA

DESIGN	DRAWN	APPROVED
HK	HK	

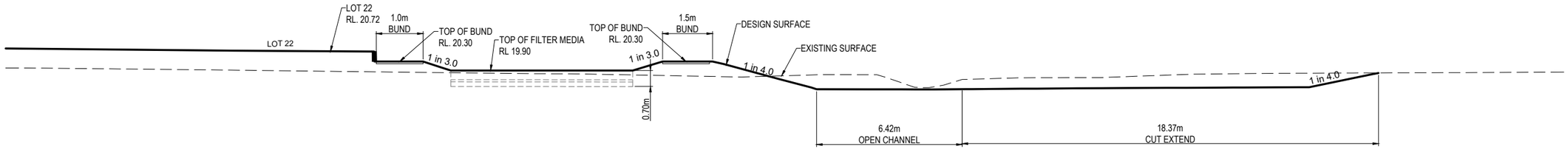
TITLE: EARTHWORKS CONCEPT PLAN

SCALE: 1:500 AT A1, 1:1000 AT A3 — 0 10 20 30 40 50m

PROJECT NO.: OSK3426

DWG NO.: P012

ISSUE: C



SECTION B
1:100 AT A1 P012

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Plans/Documents RECEIVED
08/06/2023
APPLICATION REF
A006067610,

CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

PRELIMINARY ISSUE
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ISSUE No.	DATE	AMENDMENT
C	18-05-23	ISSUED FOR REPORT
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A	10-05-22	ISSUED FOR REPORT

OSKA CONSULTING GROUP

CLIENT: QLD INTERNATIONAL INVESTMENT PTY LTD

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION
12,18 & 26 CLOVERDALE ROAD
DOOLANDELLA

DESIGN	DRAWN	APPROVED
HK	HK	

TITLE: TYPICAL BIO SECTION

SCALE: 1:100 AT A1 / 1:200 AT A3 — 0 2 4 6 8 10m

PROJECT NO.: OSK3426

DWG NO.: P013

ISSUE: C

APPENDIX

F

OSKA Consulting Group, Cloverdale Road Upgrade Works – Overall Plan and Typical Sections (Ref: OSK3426/P014/C);

78
RP 90234

77
RP88590

EXISTING LOT BOUNDARY

EXISTING VEHICULAR CROSSING
TO BE DEMOLISHED.

CLOVERDALE ROAD

EXISTING EDGE OF BITUMEN

EXISTING ROAD CL

CUT-BACK LINE TO EXISTING PAVEMENT

EXISTING EDGE OF BITUMEN

EXISTING ELECTRICITY POLE
TO BE RELOCATED (BY OTHERS)

21.31m

5.75m

3.75m

1.20m

EXISTING LOT BOUNDARY

NEW BOUNDARY

30m TAPER FROM KERB LIP BACK
TO NORMAL SHOULDER WIDTH

DRAINAGE CHANNEL EMT

DRAINAGE CHANNEL EMT

35

34

1

2

3

4

5

CONTINUE BELOW

CONTINUE ABOVE

EXISTING VEHICULAR CROSSING
TO BE DEMOLISHED.

EXISTING VEHICULAR CROSSING
TO BE DEMOLISHED. 1.2m FOOTPATH
AND KERB & CHANNEL TO BE EXTENDED

NEW BOUNDARY

EXISTING LOT BOUNDARY

5

6

7

105
SP 235699

BLUNDER ROAD

CONTROL LINE
CLOVERDALE RD

21.32m
NEW ROAD RESERVE

20.00m
EXISTING ROAD RESERVE

3.75m
NEW VERGE

7.33m

3.15m

1.20m
FOOTPATH

5.75m

6.30m
EXISTING CARRIAGEWAY

6.61m

7.09m

PROPOSED
DEVELOPMENT

NEW RP BDY

RP BDY

2.50%

VARIES

CUT BACK LINE

RP BDY

LOT 77
RP88590

DESIGN SURFACE

BARRIER KERB &
CHANNEL TYPE 'E'

PAVEMENT TO BE
CONFIRMED IN
DETAILED DESIGN

EXISTING SURFACE

CLOVERDALE ROAD - UPGRADE WORKS
TYPICAL SECTION

SCALE 1:50 (A1)

LEGEND

- PROPOSED PAVEMENT
- B1 — PROPOSED BARRIER KERB & CHANNEL TYPE 'E'
- S — PROPOSED SEWER MAIN
- W — PROPOSED POTABLE WATER MAIN
- EXISTING 225 SEWER TO BE REMOVED
- PROPOSED INVERT OF KERB
- EXISTING 225 SEWER MAIN
- EXISTING 150 WATER MAIN
- SITE BOUNDARY
- NEW BOUNDARY
- EXISTING LOT BOUNDARY
- EXISTING EDGE OF BITUMEN

CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REPORT ISSUE
NOT FOR CONSTRUCTION

BCC DS
Plans/Documents RECEIVED
08/06/2023
APPLICATION REF
A006067610,

1:50 AT A1
1:100 AT A3
0 1 2 3 4 5m

ISSUE No.	DATE	AMENDMENT
C	15-05-23	ISSUED FOR REPORT
B	26-04-23	ISSUED FOR REPORT
A	10-05-22	ISSUED FOR REPORT

OSKA CONSULTING GROUP

CLIENT: QLD INTERNATIONAL INVESTMENT PTY LTD

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION
12,18 & 26 CLOVERDALE ROAD
DOOLANDELLA

DESIGN	DRAWN	APPROVED
HK	HK	

TITLE: CLOVERDALE ROAD UPGRADE WORKS
OVERALL PLAN AND TYPICAL SECTION

SCALE: 1:200 AT A1, 1:400 AT A3 — 0 5 10 15 20m

PROJECT NO. OSK3426

DWG NO. P014

ISSUE C

APPENDIX

G

OSKA Consulting Group, Infrastructure Code (Ref: OSK3426-0017)

9.4.4 Infrastructure design code

9.4.4.1 Application

(1) This code applies to assessing a material change of use, reconfiguring a lot or building work if:

(a) assessable development where this code is identified as a prescribed secondary code in the assessment benchmarks column of a table of assessment for a material change of use (section 5.5), reconfiguring a lot (section 5.6),operational work (section 5.8), or an overlay (section 5.10); or

(b) impact assessable development, to the extent relevant.

(2) When using this code, reference should be made to section 1.5 and section 5.3.3.

Note—The following purpose, overall outcomes, performance outcomes and acceptable outcomes comprise the assessment benchmarks of this code.

Note—Where this code includes performance outcomes or acceptable outcomes that relate to:

- ecological assessment, koala habitat or development design, guidance is provided in the Biodiversity areas planning scheme policy;
- infrastructure design and construction works, guidance is provided in the Infrastructure design planning scheme policy;
- noise and dust impacts during construction and/or demolition, guidance is provided in the Management plans planning scheme policy;
- noise impact assessment, guidance is provided in the Noise impact assessment planning scheme policy;
- refuse and recycling, guidance is provided in the Refuse planning scheme policy;
- parking or servicing management during construction, guidance is provided in the Transport, access, parking and servicing planning scheme policy.

9.4.4.2 Purpose

(1) The purpose of the Infrastructure design code is to assess the suitability of infrastructure for development.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) Development is provided with a safe, connected and efficient transport network for all modes that has a minimal whole-of-life cost.

(b) Development provides for public utilities and services to the standards acceptable to the Council and the reasonable expectations of service providers.

(c) Development involving infrastructure which is intended to become a Council asset is safe, aesthetically pleasing, functional, fit for purpose, durable, minimises environmental impacts and has minimal whole-of-life cost.

(d) Development provides for a public space to be safe and inviting, allowing high levels of pedestrian activity.

(e) Development ensures that the community and environment are not unreasonably disrupted or impacted by construction or demolition for the development.

(f) Development involving infrastructure is designed with consideration of, and to integrate with, other related and interfacing infrastructure components.

(g) Development accessed by common private title is provided with appropriate fire hydrant infrastructure and has unimpeded access for refuse vehicles and for emergency service vehicles to protect people, property and the environment.

(h) Development ensures major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System is not compromised.

(i) Development for major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System avoids or otherwise minimises adverse impacts on surrounding land uses.

9.4.4.3 Performance outcomes and acceptable outcomes

Table 9.4.4.3.A—Performance outcomes and acceptable outcomes

Performance outcomes	**Acceptable outcomes**	**Response**
PO1 Development provides roads, pavement, edging and landscaping which:) are designed and constructed in accordance with the road hierarchy;) provide for safe travel for pedestrians, cyclists and vehicles;) provide access to properties for all modes;) provide utilities;) provide high levels of aesthetics and amenity, improved liveability and future growth; provide for the amelioration of noise and other pollution;) provide a high-quality streetscape;) provide a low-maintenance asset with a minimal whole-of-life cost. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO1** Development provides roads and associated pavement, edging and landscaping which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	The development will design and construct all roads and associated pavement, edging and landscaping in accordance with the Infrastructure design planning scheme policy.
PO2 Development provides road pavement surfaces	**AO2** Development provides road pavement surfaces	The development will design and construct all roads in accordance with the Infrastructure design

which:) are well designed and constructed;) durable enough to carry the wheel loads of the intended types and numbers of travelling and parked vehicles;) ensures the safe passage of vehicles, pedestrians and cyclists, the discharge of stormwater run-off and the preservation of all-weather access;) allows for reasonable travel comfort.	which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	planning scheme policy.
PO3 Development provides a pavement edge which is designed and constructed to:) control vehicle movements by delineating the carriageway for all users;) provide for people with disabilities by allowing safe passage of wheelchairs and other mobility aids.	**AO3** Development provides pavement edges which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	The development will design and construct the pavement edging in accordance with the Infrastructure design planning scheme policy.
PO4 Development provides verges which are designed and constructed to:) provide safe access for pedestrians clear of obstructions and access areas for vehicles onto properties;) provide a sufficient area for public utility services;) be maintainable by the Council.	**AO4** Development provides verges which are designed and constructed in compliance with the road corridor design and streetscape locality advice standards in the Infrastructure design planning scheme policy.	The development will design and construct the verges in accordance with the Infrastructure design planning scheme policy.
PO5 Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which:) allows equitable access for all modes;) is safe and secure;) has 24-hour access;) is a low-speed shared zone environment;) has a high-quality streetscape.	**AO5** Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which is embellished in compliance with the streetscape locality advice standards in the Infrastructure design planning scheme policy.	N/A

PO6 Development of an existing premises provides at the frontage to the site, if not already provided, the following infrastructure to an appropriate urban standard:) an effective, high-quality paved roadway;) an effective, high-quality roadway kerb and channel;) safe, high-quality vehicle crossings over channels and verges;) safe, accessible, high-quality verges compatible and integrated with the surrounding environment;) safe vehicle access to the site that enables ingress and egress in a forward gear; provision of and required alterations to public utilities;) effective drainage;) appropriate conduits to facilitate the provision of required street-lighting systems and traffic signals.	**AO6** Development of an existing premises provides at the frontage of the site, if not already existing, the following infrastructure to the standard that would have applied if the development involved new premises as stated in the road corridor design standards in the Infrastructure design planning scheme policy:) concrete kerb and channel;) forming and grading to verges;) crossings over channels and verges;) a constructed bikeway;) a constructed verge or reconstruction of any damaged verge; construction of the carriageway;) payment of costs for required alterations to public utility mains, services or installations;) construction of and required alterations to public utility mains, services or installations; drainage works; installation of electrical conduits.	The development will decommission the existing driveways on Lots 1-3 on RP90234 and construct a new kerb and channel tie into the existing property to the east. The development will provide a new vehicle crossover fronting Cloverdale Road with kerb and channel on either side to tie into the existing property to the east.
PO7 Development provides both cycle and walking routes which:) are located, designed and constructed to their network classification (where applicable);) provide safe and attractive travel routes for pedestrians and cyclists for commuter and recreational purposes;) provide safe and comfortable access to properties for pedestrians and cyclists;) incorporate water sensitive urban design into stormwater drainage;) provide for utilities;	**AO7** Development provides cycle and walking routes which are located, designed and constructed in compliance with the road corridor design and off-road pathway design standards in the Infrastructure design planning scheme policy.	N/A

provide for a high level of aesthetics and amenity, improved liveability and future growth;) are a low-maintenance asset with a minimal whole-of-life cost;) minimise the clearing of significant native vegetation. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.		
PO8 Development provides refuse and recycling collection, separation and storage facilities that are located and managed so that adverse impacts on building occupants, neighbouring properties and the public realm are minimised.	**AO8.1** Development provides refuse and recycling collection and storage facilities in accordance with the Refuse planning scheme policy.	Yes, development will provide residential refuse in accordance with refuse planning scheme
	AO8.2 Development ensures that refuse and recycling collection and storage location and design do not have any adverse impact including odour, noise or visual impacts on the amenity of land uses within or adjoining the development. Note—Refer to the Refuse planning scheme policy for further guidance.	N/A
PO9 Development ensures that:) land used for an urban purpose is serviced adequately with regard to water supply and waste disposal;) the water supply meets the stated standard of service for the intended use and fire-fighting purposes.	**AO9.1** Development ensures that the reticulated water and sewerage distribution system for all services is in place before the first use is commenced.	Yes, Queensland urban utilities shows sufficient water and sewer infrastructure to service the proposed development.
	AO9.2 Development provides the lot with reticulated water supply and sewerage to a standard acceptable to the distributor–retailer.	Refer R09.1
PO10 Development provides public utilities and street lighting which are the best current or alternative	**AO10.1** Development provides public utilities and street lighting which are located and aligned to:	N/A

technology and facilitate accessibility, easy maintenance, minimal whole-of-life costs, and minimal adverse environmental impacts.	) avoid significant native vegetation and areas identified within the Biodiversity areas overlay map;) minimise earthworks;) avoid crossing waterways, waterway corridors and wetlands or if a crossing is unavoidable, tunnel-boring techniques are used to minimise disturbance, and a disturbed area is reinstated and restored on completion of the work. Note—Guidance on the restoration of habitat is included in the Biodiversity areas planning scheme policy.	
	AO10.2 Development provides compatible public utility services and street-lighting services which are co-located in common trenching for underground services.	N/A
	AO10.3 Development provides public utilities and street lighting which are designed and constructed in compliance with the public utilities standards in the Infrastructure design planning scheme policy.	N/A
PO11 Development ensures that land used for urban purposes is serviced adequately with telecommunications and energy supply.	**AO11** Development provides land with the following services to the standards of the approved supplier:) electricity;) telecommunications services;) gas service where practicable.	Detailed design will be undertaken at operational works stage to ensure that all proposed electrical and telecommunication conduits, placed and sized appropriately.
PO12 Development ensures that major public projects promote the provision of affordable, high-bandwidth telecommunications services throughout the city.	**AO12** Development provides conduits which are provided in all major Council and government works projects to enable the future provision of fibre optic cabling, if:) the additional expense is unlikely to be prohibitive; or	N/A

	) further major work is unlikely or disruption would be a major concern, such as where there is a limited capacity road; or) there is a clear gap in the telecommunications network; or) there is a clear gap in the bandwidth available to the area. Editor's note—An accurate, digital 'as built' three-dimensional location plan is to be supplied for all infrastructure provided in a road.	
PO13 Development provides public art identified in a neighbourhood plan or park concept plan which:) is provided commensurate with the status and scale of the proposed development;) is sited and designed: as an integrated part of the project design; as conceptually relevant to the context of the location;) to reflect and respond to the cultural values of the community;) to promote local character in a planned and informed manner.	**AO13** Development provides public art identified in a neighbourhood plan or park concept plan which is sited and designed in compliance with the public art standards in the Infrastructure design planning scheme policy.	N/A
PO14 Development provides signage of buildings and spaces which promote legibility to help users find their way.	**AO14** Development provides public signage:) at public transport interchanges and stops, key destinations, public spaces, pedestrian linkages and at entries to centre developments;) which details the location of the key destinations, public spaces and pedestrian linkages in the vicinity, the services available within the development and where they are located. Editor's note—Signage is to be in accordance with Local Law Number 1 (Control of	N/A

	Advertisements Local Law).	
PO15 Development that provides community facilities which form part of the development is functional, safe, low maintenance, and fit for purpose.	**AO15** Development that provides community facilities which form part of the development is designed in compliance with the community facilities standards in the Infrastructure design planning scheme policy.	N/A
PO16 Development provides public toilets which:) are required as part of a community facility or park;) are located, designed and constructed to be: safe; durable;) resistant to vandalism;) able to service expected demand; fit for purpose.	**AO16** Development that provides public toilets is designed and constructed in compliance with the public toilets standards in the Infrastructure design planning scheme policy.	N/A
PO17 Development provides bridges, tunnels, elevated structures and water access structures that are designed and constructed using proven methods, materials and technology to provide for:) safe movement of intended users;) an attractive appearance appropriate to the general surroundings and any adjacent structures; functionality and easy maintenance;) minimal whole-of-life cost;) longevity; current and future services. Note—All bridges and elevated and associated elements must be designed and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO17** Development that provides bridges, tunnels, elevated structures and water access structures is designed and constructed in compliance with the standards in the Infrastructure design planning scheme policy.	N/A

PO18 Development provides culverts which are designed and constructed using proven methods, materials and technology to provide for:) safety;) an attractive appearance appropriate to the general surroundings;) functionality and easy maintenance;) minimal whole-of-life cost;) longevity; future widening;) current and future services;) minimal adverse impacts, such as increase in water levels or flow velocities, and significant change of flood patterns. Note—All culverts and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.	**AO18** Development that provides culverts is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	N/A
PO19 Development provides batters, retaining walls, and seawalls and river walls which are designed and constructed using proven methods, materials and technology to provide for:) safety;) an attractive appearance appropriate to the surrounding area;) easy maintenance;) minimal whole-of-life cost;) longevity; minimal water seepage. Note—All retaining walls and associated elements are to be designed and certified by a Registered	**AO19** Development that provides batters, retaining walls, seawalls and river walls is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	The development will design and construct batters and retaining walls in accordance with the Infrastructure design planning scheme policy.

Professional Engineer Queensland in accordance with the applicable design standards.		
If for development with a gross floor area greater than 1,000m^2		
PO20 Development ensures that construction is managed so that use of public spaces and movement on pedestrian, cyclist and other traffic routes is not unreasonably disrupted and existing landscaping is adequately protected from short- and long-term impacts. Note—The preparation of a construction management plan can assist in demonstrating achievement of this performance outcome. Note—The Transport, access, parking and servicing planning scheme policy provides advice on the management of vehicle parking and deliveries during construction.	**AO20** Development ensures that during construction:) the ongoing use of adjoining and surrounding parks and public spaces, such as malls and outdoor dining, is not compromised;) adjoining and surrounding landscaping is protected from damage;) safe, legible, efficient and sufficient pedestrian, cyclist and vehicular accessibility and connectivity to the wider network are maintained.	Will Comply.
PO21 Development ensures that construction and demolition activities are guided by measures that prevent or minimise adverse impacts including sleep disturbance at a sensitive use, due to noise and dust, including dust from construction vehicles entering and leaving the site. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO21.1** Development ensures that demolition and construction:) only occur between 6:30am and 6:30pm Monday to Saturday, excluding public holidays;) do not occur over periods greater than 6 months.	Will Comply.
	AO21.2 Development including construction and demolition does not release dust emissions beyond the boundary of the site.	Will Comply.
	AO21.3 Development construction and demolition does not involve asbestos-containing materials.	Will Comply.
PO22 Development ensures that:) construction and demolition do not result in	**AO22** Development ensures that the nature and scale of construction and demolition do not generate	Will Comply.

damage to surrounding property as a result of vibration;) vibration levels achieve the vibration criteria in Table 9.4.4.3.B, Table 9.4.4.3.C, Table 9.4.4.3.D and Table 9.4.4.3.E. Note—A vibration impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	noticeable levels of vibration.	
If for a material change of use or reconfiguring a lot in an urban area (as defined in the Regulation) involving premises that is, or will be, accessed by common private title, where involving buildings, either attached or detached, that are not covered by other legislation mandating fire hydrants		
PO23 Development ensures that fire hydrants are:) installed and located to enable fire services to access water safely, effectively and efficiently;) suitably identified so that fire services can locate them at all hours.	**AO23.1** Above or below ground fire hydrants are provided on residential, commercial and industrial streets and private roads, at not more than 90m intervals, and at each street intersection. Note—On residential streets, above ground fire hydrants may be single outlet. On commercial and industrial streets above ground fire hydrants should have dual valved outlets.	Yes, a fire hydrant is provided within the proposed development in front of Lot 20.
	AO23.2 Fire hydrants are identified by:) raised reflectorised pavement markers (RRPM) on sealed roads;) marker posts at the fence line where on an unsealed road, as road (HR) or path (HP) hydrants.	Will Comply.
PO24 Development ensures road widths and construction within the development, are adequate for refuse vehicles and for fire emergency vehicles to gain access to a safe working area close to buildings	**AO24** Internal private roads have a minimum roadway clearance between obstructions of 3.5m wide and 4.8m high in addition to any width required for on-street parking.	Will Comply.

and near water supplies whether or not on-street parking spaces are occupied.		
Development for major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System where not in the Utility services zone precinct of the Special purpose zone		
PO25 Development avoids or otherwise minimises adverse impacts on surrounding land uses through the use of buffers and setbacks and the appropriate design and location of plant and operational areas within the site.	**AO25** No acceptable outcome is prescribed.	N/A
Development potentially impacting on major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System where the infrastructure is not in the Utility services zone precinct of the Special purpose zone		
PO26 Development is sited and designed to:) avoid safety risks to people or property;) minimise noise and visual impacts to people and property;) ensure the physical integrity and operation, maintenance and expansion of the infrastructure is not compromised.	**AO26** No acceptable outcome is prescribed.	N/A

Table 9.4.4.3.B—Recommended intermittent vibration levels for cosmetic damage

Type of building	**Peak particle velocity (mm/s)**		
Reinforced or framed structures; industrial and heavy commercial buildings	50mm/s at 4Hz and above		
Unreinforced or light-framed structures; residential or light commercial type buildings	Below 4Hz	4Hz to 15Hz	15Hz and above
	0.6mm/s	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Table 9.4.4.3.C—Recommended blasting vibration levels for human comfort

Type of building	Type of blasting operations	Peak component particle velocity (mm/s)
Residences, schools, educational institutions and places of worship	Operation blasting longer than 12 months or more than 20 blasts	5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Residences, schools, educational institutions and places of worship	Operation blasting longer than 12 months or more than 20 blasts	10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Industry or commercial premises	All blasting	25mm/s maximum unless agreement is reached with the occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that do not adversely affect the equipment operation.

Table 9.4.4.3.D—Recommended levels for continuous and impulsive vibration acceleration (m/s^2) 1–80Hz for human comfort

Location	**Assessment period**(1)	**Preferred values**(3)		**Maximum values**(3)	
Continuous vibration		z-axis	x and y axes	z-axis	x and y axes
Critical areas(2)	Day or night	0.005 m/s^2	0.0036 m/s^2	0.01 m/s^2	0.0072 m/s^2
Residences	Day	0.01 m/s^2	0.0071 m/s^2	0.02 m/s^2	0.014 m/s^2
-	Night	0.007 m/s^2	0.005 m/s^2	0.014 m/s^2	0.01 m/s^2
Offices, schools, educational institutions and places of worship	Day or night	0.02 m/s^2	0.014 m/s^2	0.04 m/s^2	0.028 m/s^2
Workshops	Day or night	0.04 m/s^2	0.029 m/s^2	0.08 m/s^2	0.058 m/s^2
Impulsive vibration					
Critical areas	Day or night	0.005 m/s^2	0.0036 m/s^2	0.01 m/s^2	0.0072 m/s^2
Residences	Day	0.3 m/s^2	0.21 m/s^2	0.6 m/s^2	0.42 m/s^2
-	Night	0.1 m/s^2	0.071 m/s^2	0.2 m/s^2	0.14 m/s^2
Offices, schools, educational institutions and places of worship	Day or night	0.64 m/s^2	0.46 m/s^2	1.28 m/s^2	0.92 m/s^2
Workshops	Day or night	0.64 m/s^2	0.46 m/s^2	1.28 m/s^2	0.92 m/s^2

Note—

(1) Day is 7am to 10pm and night is 10pm to 7am.

(2) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

Table 9.4.4.3.E—Recommended vibration dose values for intermittent vibration (m/s$^{1.75}$) for human comfort

Location	**Daytime**(1)		**Night time**(1)	
	Preferred value	**Maximum value**	**Preferred value**(3)	**Maximum value**(3)
Critical areas(2)	0.1 m/s$^{1.75}$	0.2 m/s$^{1.75}$	0.1 m/s$^{1.75}$	0.2 m/s$^{1.75}$
Residences	0.2 m/s$^{1.75}$	0.4 m/s$^{1.75}$	0.13 m/s$^{1.75}$	0.26 m/s$^{1.75}$
Offices, schools, educational institutions and places of worship	0.4 m/s$^{1.75}$	0.8 m/s$^{1.75}$	0.4 m/s$^{1.75}$	0.8 m/s$^{1.75}$
Workshops	0.8 m/s$^{1.75}$	1.6 m/s$^{1.75}$	0.8 m/s$^{1.75}$	1.6 m/s$^{1.75}$

Note—

(1) Day is 7am to 10pm and night is 10pm to 7am.

(2) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

APPENDIX

H

OSKA Consulting Group, Filling and Excavation Code (Ref: OSK3426-0018)

9.4.3 Filling and excavation code

9.4.3.1 Application

(1) This code applies to assessing:

(a) accepted development subject to compliance with identified requirements, where acceptable outcomes of this code are identified requirements in a table of assessment for an overlay (section 5.10); or

(b) operational work for filling or excavation which is assessable development if this code is an applicable code identified in the assessment benchmarks column of a table of assessment for operational work (section 5.8) or an overlay (section 5.10); or

(c) a material change of use or reconfiguring a lot if:

(i) assessable development where this code is identified as a prescribed secondary code in the assessment benchmarks column of a table of assessment for material change of use (section 5.5) or reconfiguring a lot (section 5.6); or

(ii) impact assessable development, to the extent relevant.

Note—The following purpose, overall outcomes, performance outcomes and acceptable outcomes comprise the assessment benchmarks of this code.

Note—This code does not apply to building work as defined in the Act.

Note—A development application involving a rock anchor within an adjoining site is submitted with proof of consent from an adjoining land and building owner.

Editor's note—Guidance on managing the spread of invasive species in filling or excavation activities is provided in Minimising Pest Spread Advisory Guidelines prepared for the Petroleum industry.

Editor's note—Where filling or excavation is conducted on land previously occupied by a notifiable activity or on land listed on the Environmental Management Register or the Contaminated Land Register, the relevant Queensland Government department should be contacted for advice and guidelines.

(2) When using this code, reference should be made to section 1.5 and section 5.3.3.

Note—Where this code includes performance outcomes or acceptable outcomes that relate to:

- air quality assessment, guidance is provided in the Air quality planning scheme policy;
- ecological assessment, koala habitat or development design, guidance is provided in the Biodiversity areas planning scheme policy;
- retaining wall construction, guidance is provided in the Infrastructure design planning scheme policy;
- landscape design, guidance is provided in the Landscape design guidelines for water conservation planning scheme policy;
- noise and dust impacts during construction and/or demolition, guidance is provided in the Management plans planning scheme policy;
- noise impact assessment, guidance is provided in the Noise impact assessment planning scheme policy;
- the selection of planting species, guidance is provided in the Planting species planning scheme policy;
- significant vegetation, guidance is provided in the Vegetation planning scheme policy.

Editor's note—For a proposal to be accepted development, subject to compliance with identified requirements, it must meet all the identified acceptable outcomes of this code and any other applicable code. Where it does not meet all identified acceptable outcomes, the proposal becomes assessable development and a development application is required. Where a development application is triggered, only the specific acceptable outcome that the proposal fails to meet needs to be assessed against the corresponding acceptable outcome or performance outcome and relevant overall outcomes. Other identified acceptable outcomes that are met are not assessed as part of the development application.

9.4.3.2 Purpose

(1) The purpose of the Filling and excavation code is to assess the suitability of development for filling or excavation.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) Filling or excavation does not adversely affect the visual character and amenity of the site or the surrounding area and provides access for maintenance to any structure as a result of filling or excavation.

(b) Filling or excavation does not adversely impact significant vegetation, water quality or drainage of upstream, downstream and adjoining land.

(c) Filling or excavation effectively manages the impacts associated with the activity.

(d) Filling or excavation and any retaining structure is designed and constructed to be fit for purpose and to protect services and utilities.

9.4.3.3 Performance outcomes and acceptable outcomes

Table 9.4.3.3.A—Performance outcomes and acceptable outcomes

Performance outcomes	Acceptable outcomes	Response
PO1 Development for filling or excavation minimises visual impacts from retaining walls and earthworks.	**AO1** Development ensures that the total height of any cut and fill, whether or not retained, does not exceed:) 2.5m in a zone in the Industry zones category;) 1m in all other zones, or if adjoining a sensitive zone.	All retaining walls proposed for the development for the development will not exceed 2.5m in a zone in the Industry zones category and 1m in all other zones, or if adjoining a sensitive zone.
PO2 Development of a retaining wall proposed as a result of filling or excavation:) is designed and constructed to be fit for purpose;) does not impact adversely on significant vegetation;) is capable of easy maintenance. Editor's note—A retaining wall also needs to comply with the Building Regulation and embankment gradients will need to comply with the Building Regulation. Note—Guidance on the protection of native vegetation is included in the Biodiversity areas planning scheme policy.	**AO2.1** Development of a retaining structure, including footings, surface drainage and subsoil drainage:) is wholly contained within the site;) if the total height to be retained is greater than 1m, then: the retaining wall at the property boundary is no greater than 1m above the ground level; all further terracing from the 1m high boundary retaining wall is 1 vertical unit:1 horizontal unit;) the distance between each successive retaining wall (back of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas.	All retaining walls proposed for the development for the development will be wholly within the site and as part of the building structure.
	AO2.2 Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland.	N/A
	AO2.3 Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the	N/A

	boundary.	
	AO2.4 Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species listed as an undesirable plant species in the Planting species planning scheme policy .	Yes
PO3 Development ensures that a rock anchor is designed and constructed to be fit for purpose.	**AO3** Development ensures that a rock anchor:) is constructed in accordance with the standards in the Infrastructure design planning scheme policy;) where it extends beyond the property boundary, is supported by a letter of consent from the adjoining land and building owners.	N/A
PO4 Development protects all services and public utilities.	**AO4** Development protects services and public utilities and ensures that any alteration or relocation of services or public utilities meets the standard design specifications of the responsible service authorities.	Prior to construction, contractors will confirm the correct locations of the local authorities existing assets within the area of construction. The construction of the proposed development will ensure the protection of each existing service or public utilities.
PO5 Development provides surface and sub-surface drainage to prevent water seepage, concentration of run-off or ponding of stormwater on adjacent land.	**AO5** Development ensures all flows and subsoil drainage are directed to a lawful point of discharge of a surface water diversion drain, including to the top or toe of a retaining wall in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	All proposed earthworks will be undertaken in accordance with BCC stormwater drainage section of the infrastructure design planning scheme policy. Earthworks will be designed to prevent ponding of stormwater on site and on neighbouring land. All stormwater surface runoff and subsoil flows will be directed to the lawful point of discharge. Refer to BCC stormwater management code.

PO6 Development ensures that the design and construction of all open drainage works is undertaken in accordance with natural channel design principles, being the development of a stormwater conveyance system for major flows, by using a vegetated open channel or drain that approximates the features and functions of a natural waterway to enhance or improve riparian values of those stormwater conveyance systems. Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines.	**AO6** Filling or excavation does not involve the construction of open drainage.	The design and construction of the open drainage channel will be in accordance with Natural channel design principles and guidelines.
PO7 Development for filling or excavation:) does not degrade water quality or adversely affect environmental values in receiving waters;) ensures site sediment and erosion control standards are best practice.	**AO7.1** Development for filling or excavation provides water quality treatment that complies with the stormwater drainage section of the Infrastructure design planning scheme policy.	Yes
	AO7.2 Development provides erosion and sediment control standards that are in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	Yes
PO8 Development for filling or excavation is conducted such that adverse impacts at a sensitive use due to noise and dust are prevented or minimised. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO8.1** Development ensures that no dust emissions extend beyond the boundary of the site, including dust from construction vehicles entering and leaving the site.	If required hose water shall be used to minimise the dust emission. This will be detailed in the erosion and sediment control plan to be prepared for the construction phase.
	AO8.2 Development for filling or excavation activity only occurs between the hours of 6:30am and 6:30pm Monday to Saturday, excluding public holidays.	Earthworks for the proposed development shall be performed within the prescribed hours

PO9 Development ensures that vibration generated by the filling or excavation operation does not exceed the vibration criteria in Table 9.4.3.3.B, Table 9.4.3.3.C, Table 9.4.3.3.Dand Table 9.4.3.3.E. Note—A noise management report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO9** Development involving filling or excavation does not cause a ground-borne vibration beyond the boundary of the site.	No ground-borne vibration will result beyond the boundary of the site from the earthworks of the development
PO10 Development ensures that heavy trucks hauling material to and from the site do not affect the amenity of established areas and limits environmental nuisance impact on adjacent land.	**AO10** Development ensures that heavy trucks hauling material to and from the site:) occur for a maximum of 3 weeks;) use a major road to access the site;) only use a minor road for the shortest-most-direct route that has the least amount of environmental nuisance if there is no major road alternative.	Yes, if required a construction management plan shall be provided by contractor. Access to site will be via Cloverdale Road, haul routes from trucks used to transport spoil and material to and from the site will only use major roads as required. Alternatively if there is no major roads to the site, haul trucks will use minor roads with the shortest, most direct route that will have the least amount of environmental impact.
PO11 Development for filling or excavation protects the environment and community health and wellbeing from exposure to contaminated land and contaminated material.	**AO11** Development does not involve:) excavation on land previously occupied by a notifiable activity or on land listed on the Environmental Management Register or the Contaminated Land Register;) filling with material containing a contaminant.	N/A

PO12 Development provides for:) landscaping for water conservation purposes;) water sensitive urban design measures which are employed within the landscape design to maximise stormwater use and to reduce any adverse impacts on the landscape;) stormwater harvesting to be maximised and any adverse impacts of stormwater minimised.	**AO12.1** Development provides landscaping which is designed using the standards in the Landscape design guidelines for water conservation planning scheme policy.	Refer BCC Stormwater code
	AO12.2 Development ensures that the design and requirements for irrigation are in compliance with the standards in the Landscape design guidelines for water conservation planning scheme policy.	Refer BCC Stormwater code
	AO12.3 Development provides areas of pavement, turf and mulched garden beds which are drained. Note—This may be achieved through the provision and/or treatment of swales, spoon drains, field gullies, sub-surface drainage and stormwater connections.	Refer BCC Stormwater code
PO13 Development ensures cutting and filling for the development of canals or artificial waterways avoids adverse impacts on coastal resources and processes.	**AO13** Development does not involve the creation of canals or artificial waterways.	N/A

Table 9.4.3.3.B— Recommended intermittent vibration levels for cosmetic damage

Type of building	**Peak particle velocity (mm/s)**		
Reinforced or framed structures; industrial and heavy commercial buildings	50mm/s at 4Hz and above		
Unreinforced or light-framed structures; residential or light-commercial type buildings	Below 4Hz	4Hz to 15Hz	15Hz and above
	0.6mm/s	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Table 9.4.3.3.C— Recommended blasting vibration levels for human comfort

Type of building	Type of blasting operations	Peak component particle velocity (mm/s)
Residences, schools, educational institutions and places of worship	Operation blasting longer than 12 months or more than 20 blasts	5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Residences, schools, educational institutions and places of worship	Operations lasting for less than 12 months or less than 20 blasts	10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Industry or commercial premises	All blasting	25 mm/s maximum unless agreement is reached with the occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that do not adversely affect the equipment operation.

Table 9.4.3.3.D— Recommended levels for continuous and impulsive vibration acceleration (m/s^2) 1–80Hz for human comfort

Location	**Assessment period**(1)	**Preferred values**(3)		**Maximum values**(3)	
Continuous vibration		z-axis	x and y axes	z-axis	x and y axes
Critical areas(2)	Day or night	0.005 m/s^2	0.0036 m/s^2	0.01 m/s^2	0.0072 m/s^2
Residences	Day	0.01 m/s^2	0.0071 m/s^2	0.02 m/s^2	0.014 m/s^2
-	Night	0.007 m/s^2	0.005 m/s^2	0.014 m/s^2	0.01 m/s^2
Offices, schools, educational institutions and places of worship	Day or night	0.02 m/s^2	0.014 m/s^2	0.04 m/s^2	0.028 m/s^2
Workshops	Day or night	0.04 m/s^2	0.029 m/s^2	0.08 m/s^2	0.058 m/s^2
Impulsive vibration					
Critical areas	Day or night	0.005 m/s^2	0.0036 m/s^2	0.01 m/s^2	0.0072 m/s^2
Residences	Day	0.3 m/s^2	0.21 m/s^2	0.6 m/s^2	0.42 m/s^2
-	Night	0.1 m/s^2	0.071 m/s^2	0.2 m/s^2	0.14 m/s^2
Offices, schools, educational institutions and places of worship	Day or night	0.64 m/s^2	0.46 m/s^2	1.28 m/s^2	0.92 m/s^2
Workshops	Day or night	0.64 m/s^2	0.46 m/s^2	1.28 m/s^2	0.92 m/s^2

Note—

(1) Day is 7am to 10pm and night is 10pm to 7am.

(2) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

Table 9.4.3.3.E— Recommended vibration dose values for intermittent vibration ($m/s^{1.75}$) for human comfort

Location	**Daytime**(1)		**Night time**(1)	
	Preferred value	**Maximum value**	**Preferred value**(3)	**Maximum value**(3)
Critical areas(2)	0.1 $m/s^{1.75}$	0.2 $m/s^{1.75}$	0.1 $m/s^{1.75}$	0.2 $m/s^{1.75}$
Residences	0.2 $m/s^{1.75}$	0.4 $m/s^{1.75}$	0.13 $m/s^{1.75}$	0.26 $m/s^{1.75}$
Offices, schools, educational institutions and places of worship	0.4 $m/s^{1.75}$	0.8 $m/s^{1.75}$	0.4 $m/s^{1.75}$	0.8 $m/s^{1.75}$
Workshops	0.8 $m/s^{1.75}$	1.6 $m/s^{1.75}$	0.8 $m/s^{1.75}$	1.6 $m/s^{1.75}$

Note—

(1) Day is 7am to 10pm and night is 10pm to 7am.

(2) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

APPENDIX

I

BCC Erosion Hazard Assessment Form

BRISBANE CITY COUNCIL ABN 72 002 765 795

Erosion Hazard Assessment - June 2014

Brisbane City Council (BCC), *Erosion Hazard Assessment* form must be read in conjunction with the *Erosion Hazard Assessment- Supporting Technical Notes* (June 2014 or later version) for explanatory terms and Certification information.

What is an Erosion Hazard Assessment?

Soil erosion and sediment from urban development, particularly during construction activities, is a significant source of sediment pollution in Brisbane's waterways. The Erosion Hazard Assessment determines whether the risk of soil erosion and sediment pollution to the environment is 'low' , 'medium' or 'high'.

When is the EHA required?

An *Erosion Hazard Assessment* form must be completed and lodged with BCC for any Development Application (ie MCU or ROL) that will result in soil disturbance OR Operational Works or Compliance Assessment Application for 'Filling' or Excavation.

Failure to submit this form during lodgement of an application may result in assessment delays or refusal of the application.

Privacy Statement

The personal information collected on this form will be used by Brisbane City Council for the purposes of fulfilling your request and undertaking associated Council functions and services. Your personal information will not be disclosed to any third party without your consent, unless this is required or permitted by law.

Assessment Details

1 Please turn over and complete the erosion hazard assessment.

2 Based on the erosion hazard assessment overleaf, is the site:

☐ ***A 'low' risk site***

Best practice erosion and sediment control (ESC) must be implemented but no erosion and sediment control plans need to be submitted with the development application. Factsheets outlining best practice ESC can be found at http://www.waterbydesign.com.au/factsheets

☐ ***A 'medium' risk site***

If the development is approved, the applicant will need to engage a Registered Professional Engineer (RPEQ) or Certified Professional in Erosion and Sediment Control (CPESC) to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy.

☑ ***A 'high' risk site***

If the development is approved, the applicant will need to engage a RPEQ and CPESC to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy. The plans and program will need to be certified by a CPESC.

3 Site Information and Certification

Application number (if known)

Site address

12, 18 & 26 Cloverdale Road, Doolandella

Postcode 4077

I certify that:

- ☑ I have made all relevant enquiries and am satisfied no matters of significance have been withheld from the assessment manager.
- ☑ I am a person with suitable qualifications and/or experience in erosion and sediment control.
- ☑ The Erosion Hazard Assessment was completed in accordance with the Erosion Hazard Assessment Supporting Technical Notes and the BCC Infrastructure Design Planning Scheme Policy.
- ☑ The Erosion Hazard Assessment accurately reflects the site's overall risk of soil erosion and sediment pollution to the environment.
- ☑ I acknowledge and accept that the BCC, as assessment manager, relies, in good faith, on this certification as part of its development assessment process and the provision of false or misleading information to the BCC constitutes an offence for which BCC may take punitive steps/ action against me/ enforcement action against me.

Certified by *Print name*

Daley Curran

Certifier's signature

Date

21 / 04 / 2023

Assessment Table

Table 1: Low Risk Test

		Yes	*No*
1.1	is the area of land disturbance > 1000 m^2	☑	☐
1.2	does any land disturbance occur in a BCC mapped waterway corridor	☑	☐
1.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 5%	☑	☐
1.4	does any land disturbance occur below 5 m AHD	☐	☑
1.5	does development involve endorsement of a staging plan	☐	☑
1.6	is there an upstream catchment passing through the site > 1 hectare	☑	☐

Have you answered 'yes' to any of the questions in Table 1?	*Yes*	*No*	**If '*No*' then site is <u>low risk</u> with respect to erosion and sediment control**
	☑	☐	

If '*Yes*' then proceed to Table 2

Table 2: Medium Risk Test

		Yes	*No*	**If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control**
2.1	is the area of land disturbance > 1 hectare	☑	☐	

If '*Yes*' then proceed to Table 3

Table 3: High Risk Test

		Yes	*No*
3.1	is there an upstream catchment passing through the site > 1 hectare	☑	☐
3.2	does any land disturbance occurs in a BCC mapped waterway corridor	☑	☐
3.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 15%	☐	☑

Have you answered 'yes' to any of the questions in Table 3?	*Yes*	*No*	**If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control**
	☑	☐	

If '*Yes*' then site is <u>high risk</u> with respect to erosion and sediment control

APPENDIX

J

Dial Before You Dig Plans

Job No 31867272

Phone: 1100
www.1100.com.au

Caller Details

Contact:	Jason Webster	**Caller Id:**	3027838	**Phone:**	(07) 5580 9777
Company:	Not supplied				
Address:	155 Varsity Parade Varsity Lakes QLD 4227	**Email:**	jwebster@oska.net.au		

Dig Site and Enquiry Details

WARNING: The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

User Reference: OSK3426

Working on Behalf of: Private

Enquiry Date:	**Start Date:**	**End Date:**
03/05/2022	06/06/2022	30/06/2022

Address:
18 Cloverdale Road
Doolandella QLD 4077

Job Purpose:	**Onsite Activities:**
Excavation	Mechanical Excavation
Location of Workplace:	**Location in Road:**
Both	Road, Nature Strip, Footpath

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Notes/Description of Works:

Not supplied

Your Responsibilities and Duty of Care

- The lodgement of an enquiry does not authorise the project to commence. You must obtain all necessary information from any and all likely impacted asset owners prior to excavation.
- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at **www.1100.com.au**
- **For more information on safe excavation practices, visit www.1100.com.au**

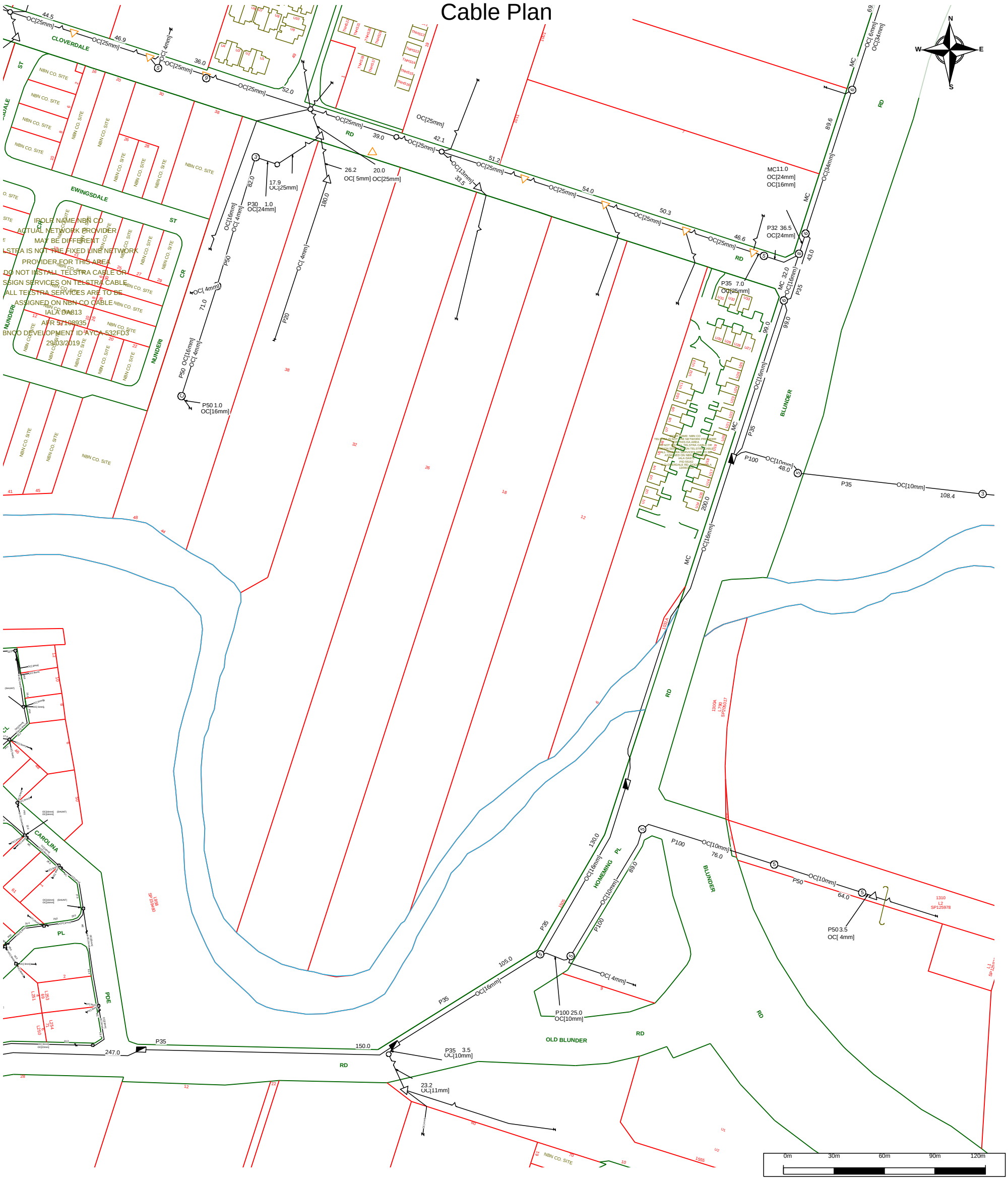
Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days.
Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.
** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.
# Asset owners highlighted with a hash # require that you call them to discuss your enquiry or to obtain plans.

Seq. No.	Authority Name	Phone	Status
210917549	APT Management Services Pty Ltd 2	1800 103 452	NOTIFIED
210917548	APT Management Services Pty Ltd (Allgas)	1800 085 628	NOTIFIED
210917542	Brisbane City Council	(07) 3403 8888	NOTIFIED
210917544	Energex QLD	13 12 53	NOTIFIED
210917545	NBN Co Qld	1800 687 626	NOTIFIED
210917547	Queensland Urban Utilities	13 23 64	NOTIFIED
210917546	Santos EABU	1800 882 185	NOTIFIED
210917543	Telstra QLD FA	1800 653 935	NOTIFIED

END OF UTILITIES LIST

Cable Plan



For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 210917543
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.
Generated On 03/05/2022 13:18:34	

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

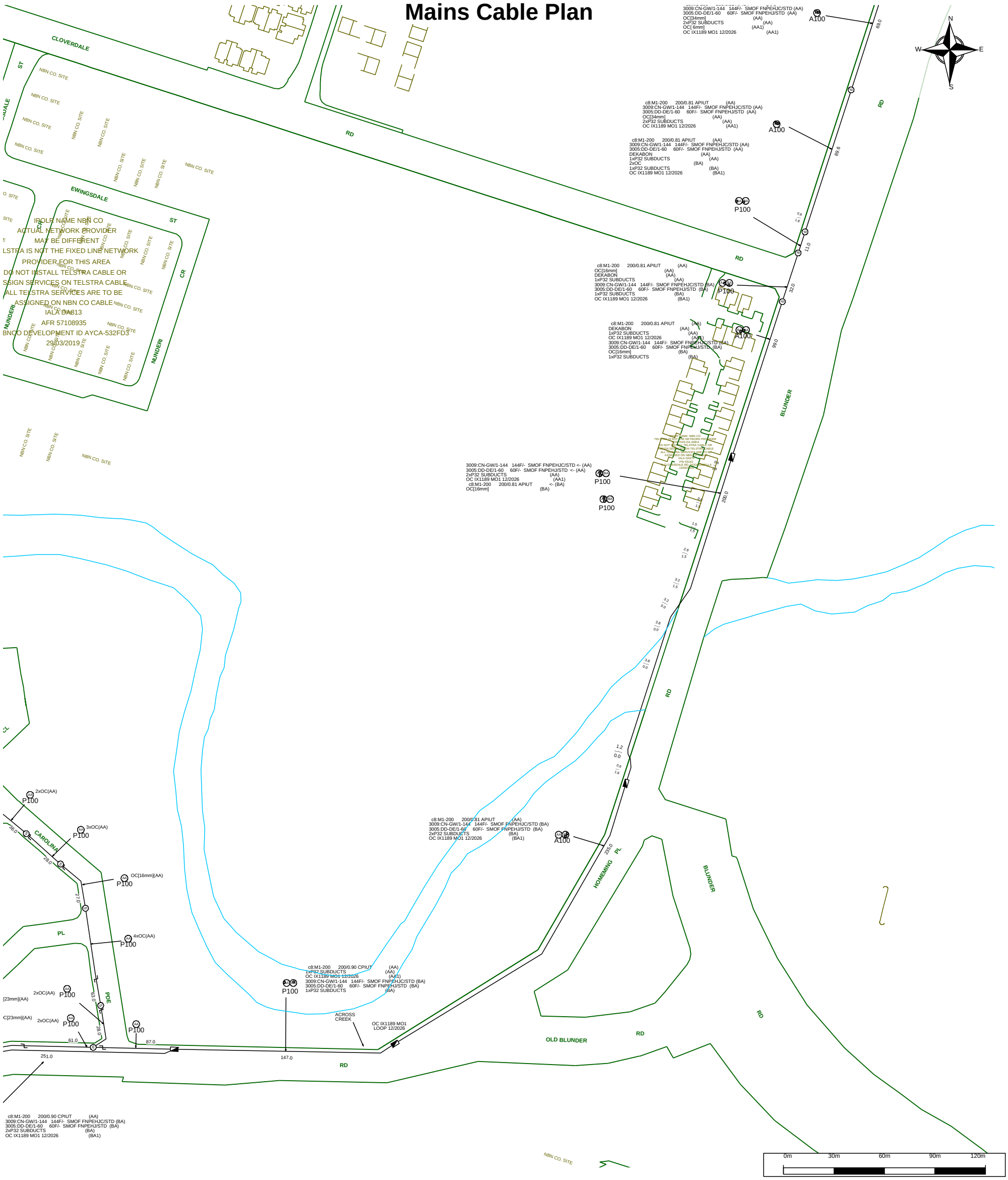
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Mains Cable Plan



For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 210917543
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.
Generated On 03/05/2022 13:18:36	

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

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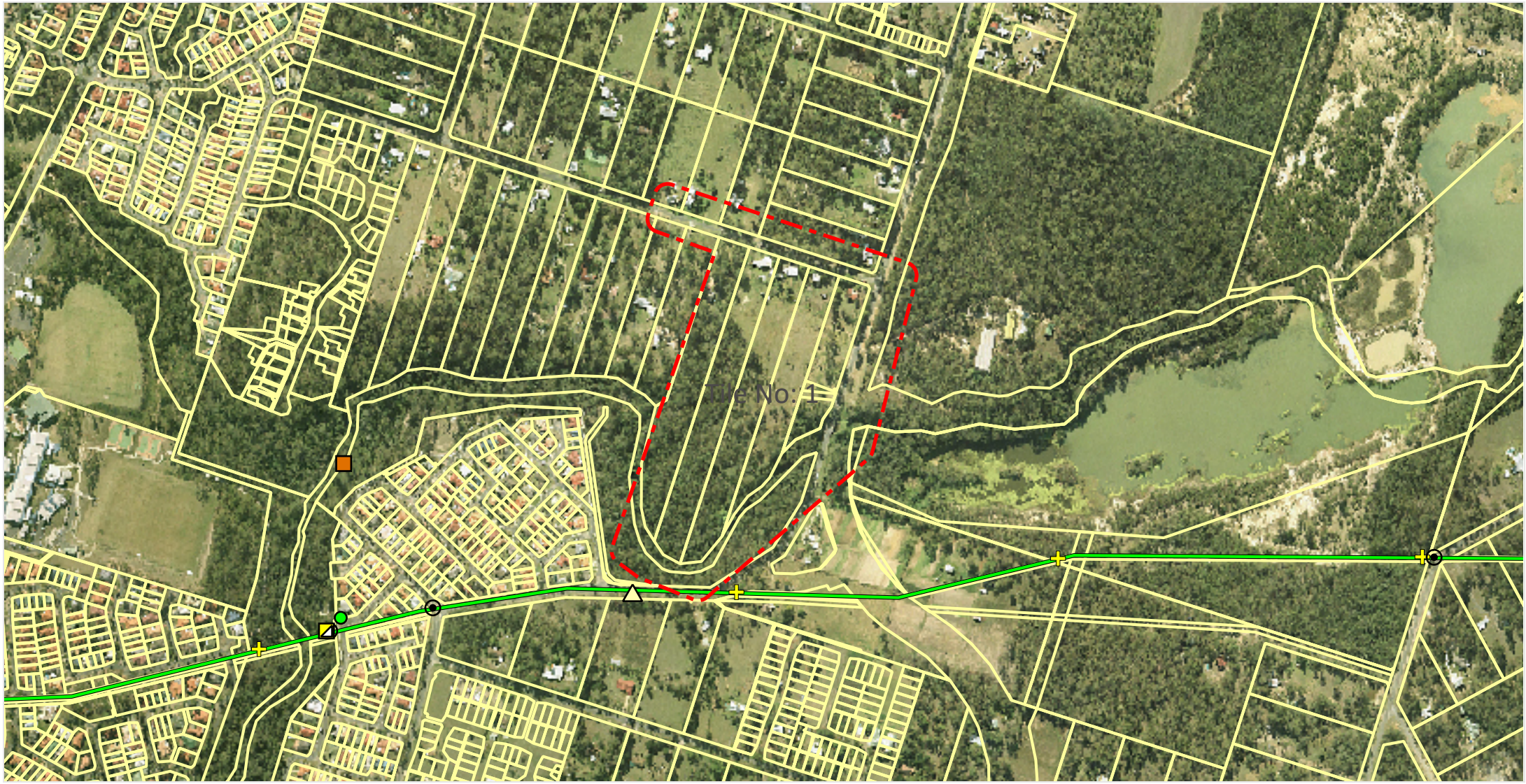
Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Sequence No.: **210917546**

Address: **18 Cloverdale Road, Doolandella, QLD 4077**

Santos
We have the energy.



Create Date: 03/05/2022

Scale: 1:8000

Legend

- Pipeline Infrastructure
- Pipeline Facility
- CP Anode Bed (buried cabling)
- CP Test Point (buried cabling)
- CP TR (buried cabling)
- High Pressure Oil Pipeline
- High Pressure Gas Pipeline

Santos Ltd
ABN 80 007 550 923

EQ Pipelines

PO Box 1010,
BRISBANE QLD 4000

OneCall: 1800 882 185
email: eq.pipelines@santos.com

Date: 03/05/2022

DBYD Enquiry. 210917546
Job No. 31867272

The information provided within your Dial Before Your Dig (DBYD) Enquiry indicates the intended works may impact upon the High Pressure Transmission Pipeline (the pipeline) and/or registered easement (easement), owned and operated by Santos.

Submitted by:	Jason Webster
Location:	18 Cloverdale Road Doolandella QLD 4077
Activity:	Mechanical Excavation
Commencement Date:	06/06/2022
Message:	

DISCLAIMER! This response and any additional information has been assessed and compiled from, and is subject to the accuracy of, the information detailed within the DBYD Enquiry outlined above; please ensure these details and the details provided accurately reflect the proposed works. If you have any queries or the details are not accurate, please contact our office.

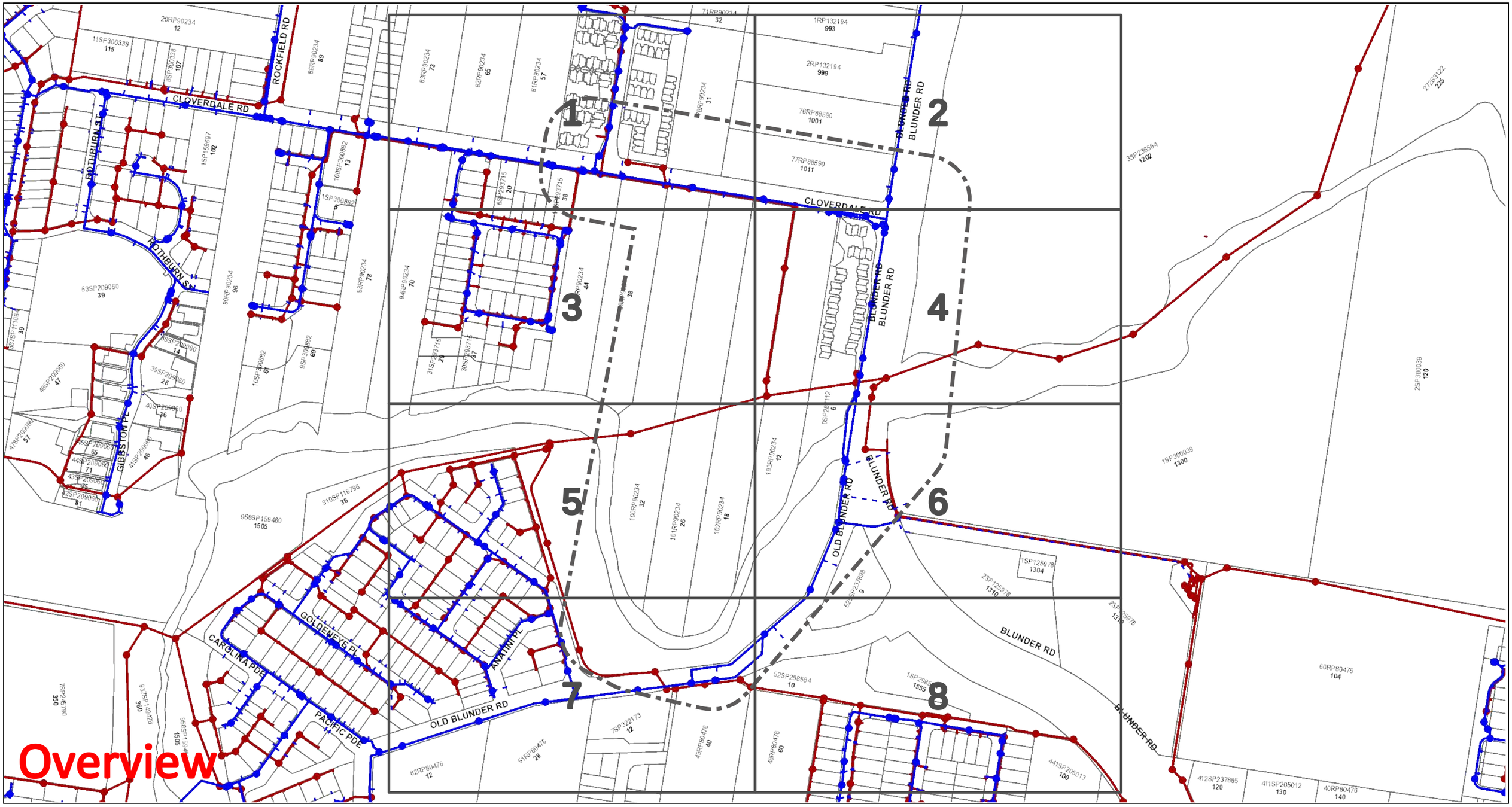
All proposed works that directly impact upon the pipeline, easement and/or associated infrastructure, are subject to review by Santos and formal authorisation.

Please contact our office to discuss the intended works in more detail prior to the commencement of any works.

All works (including excavation) on or within 15 metres of the pipeline or easement require issue of an onsite Pipeline Activity Record (Consent to Work) and may require ongoing supervision by a Santos representative.

We thank you for your DBYD enquiry.

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

DBYD Reference No: 210917547

Date DBYD Ref Received: 03/05/2022

Date DBYD Job to Commence: 06/06/2022

Date DBYD Map Produced: 03/05/2022

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer

- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures

Water

- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures
- Water Service (Indicative only)

N

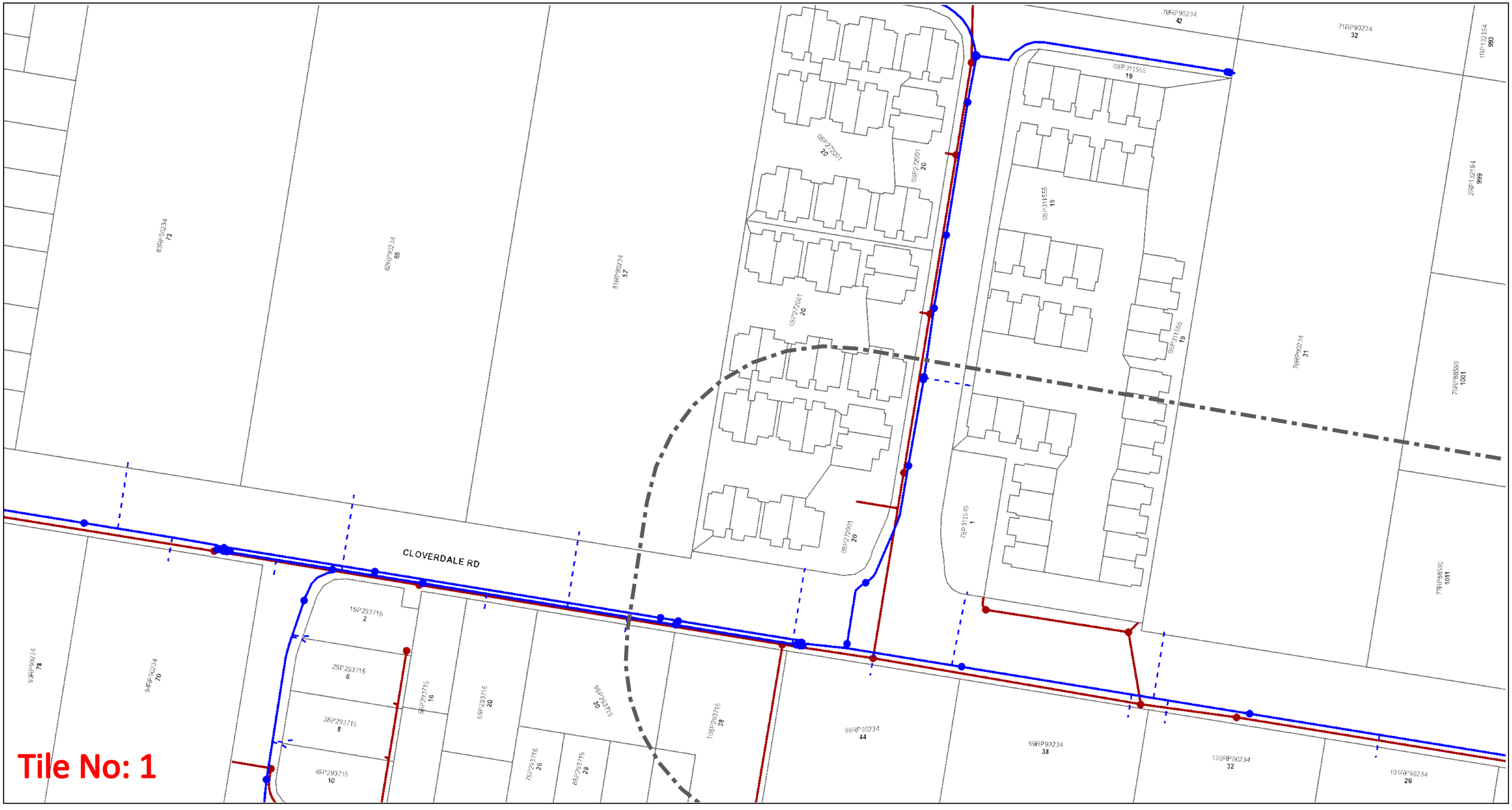
Map Scale 1:4100

For further information, please call Urban Utilities on 13 26 57 (8am-6pm weekdays). Faults and emergencies 13 23 64 (24/7).

www.urbanutilities.com.au

ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



Tile No: 1

Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

UrbanUtilities

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This Map is valid for 30 days

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Map Scale 1:1000

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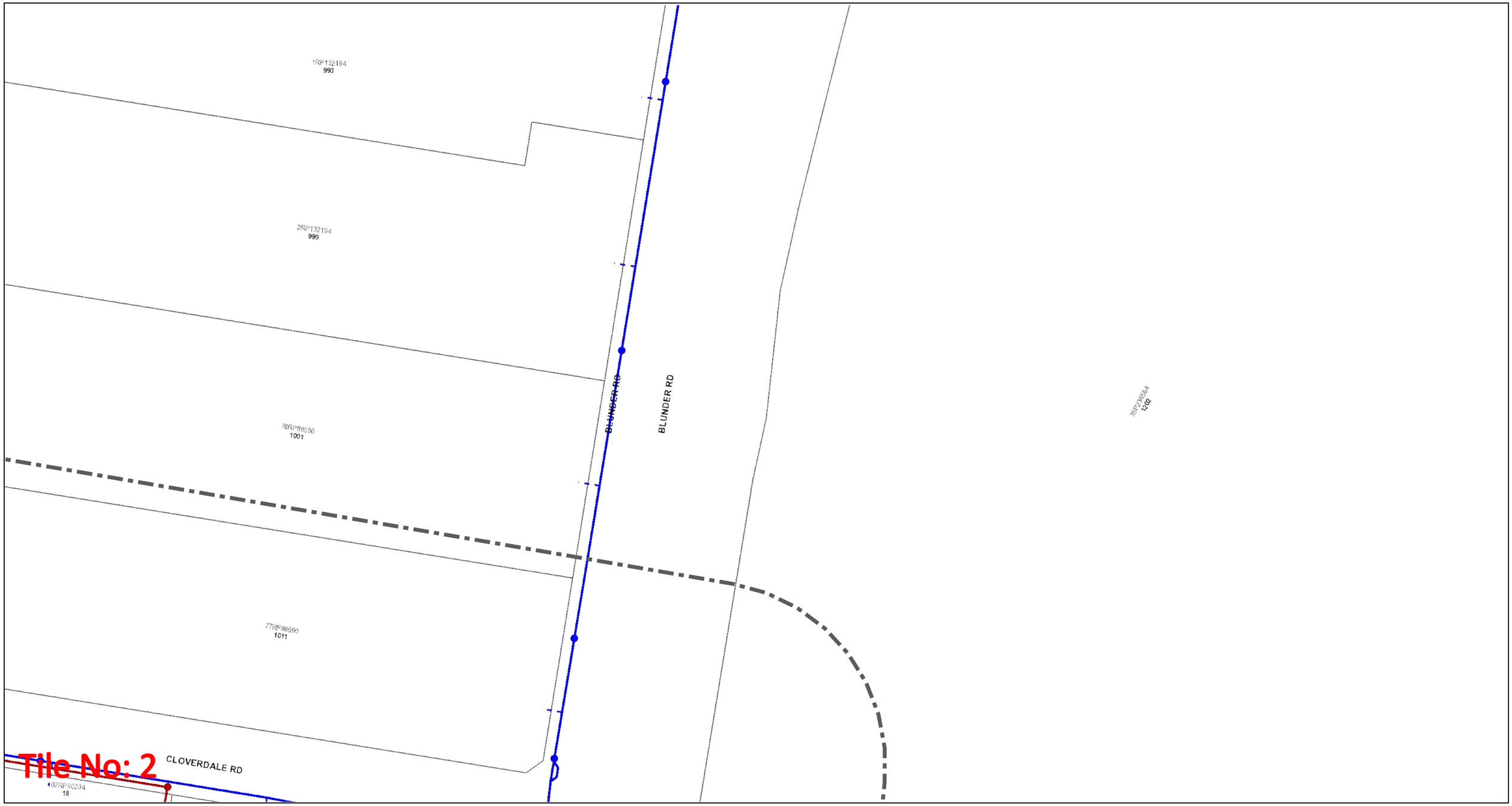
Urban Utilities - Water, Recycled Water and Sewer Infrastructure



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Produced By: Urban Utilities

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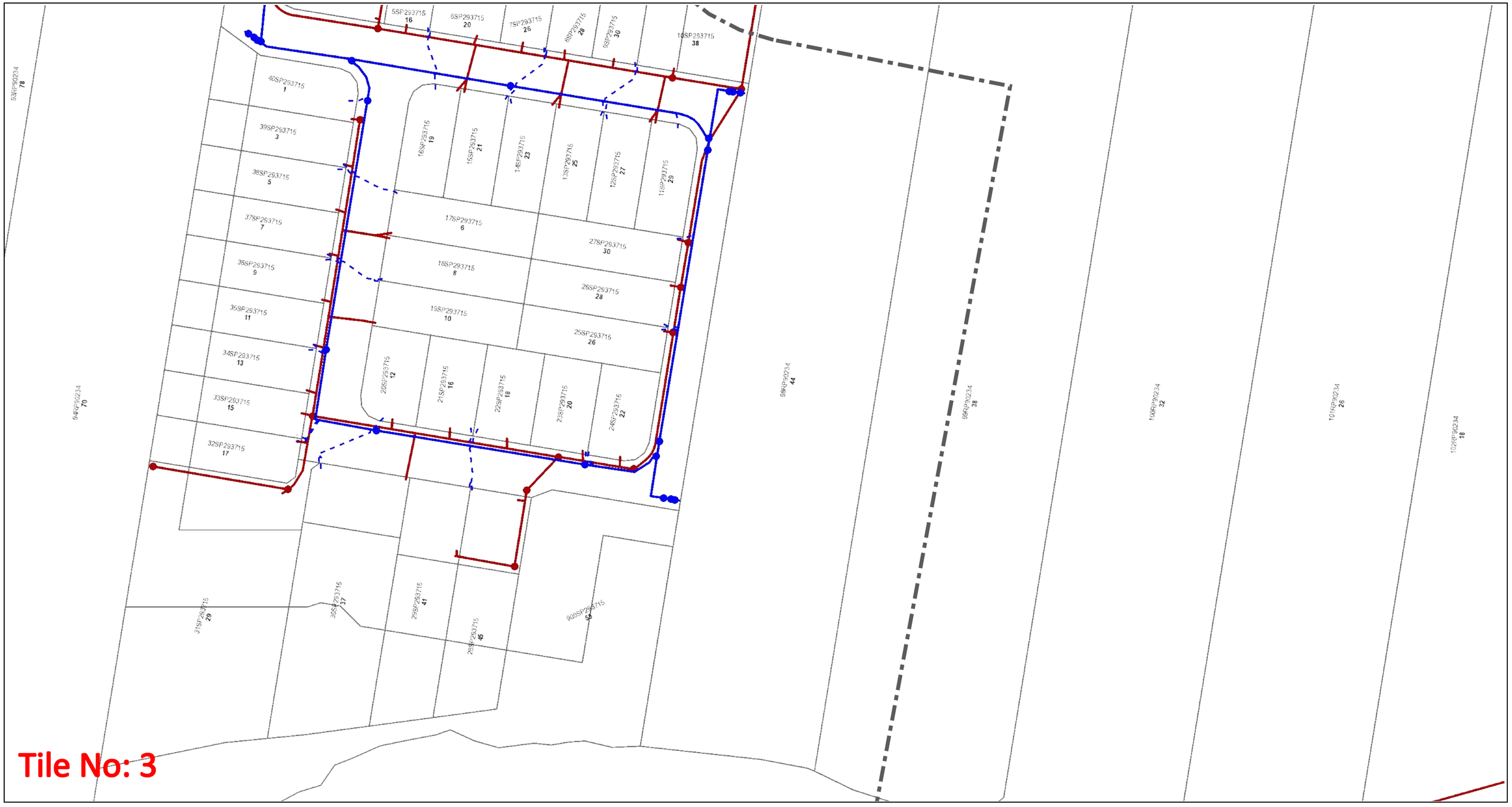

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ABN 86 673 835 011

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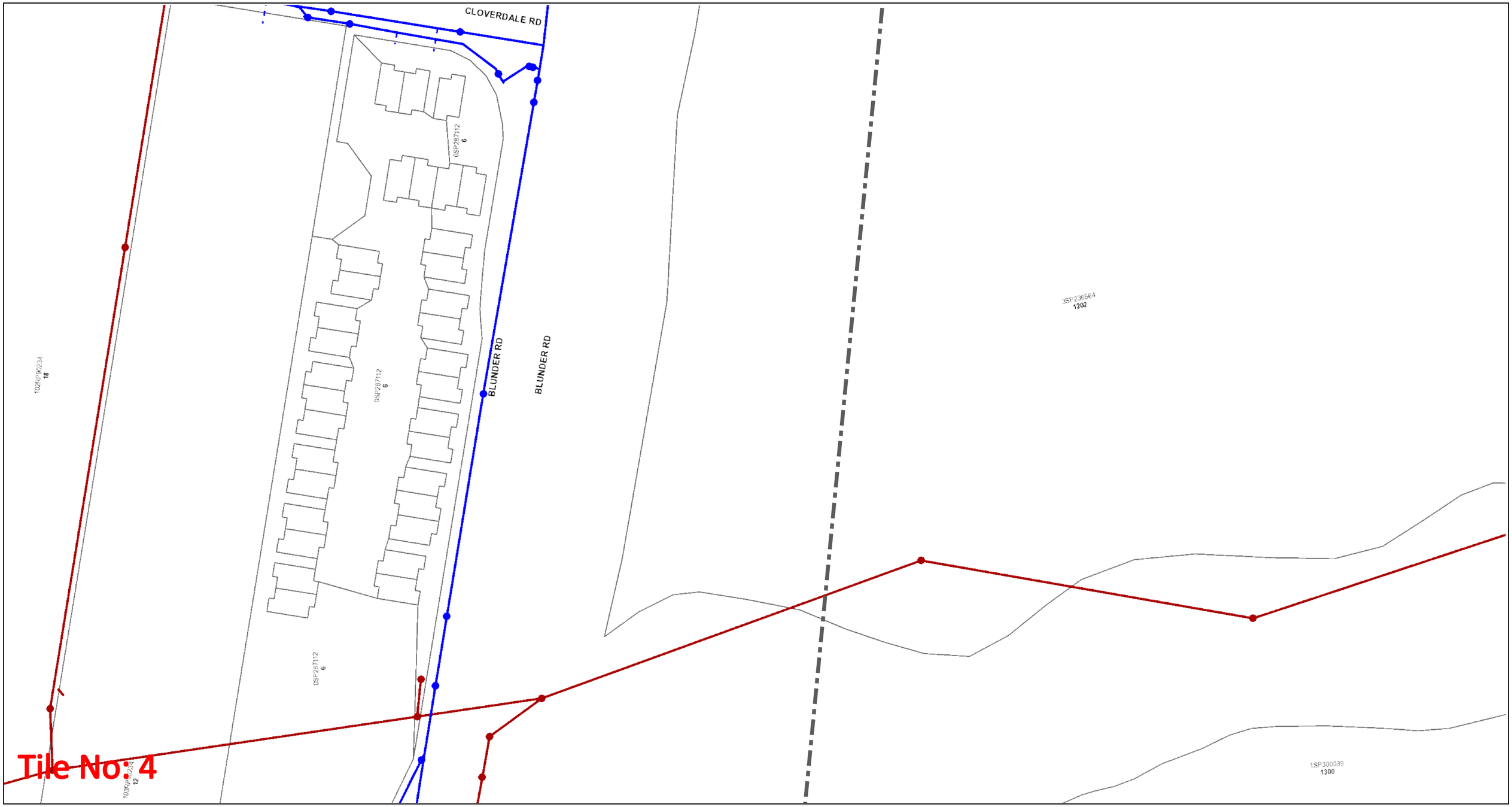

Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

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Produced By: Urban Utilities

Sewer

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Water

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Map Scale 1:1000

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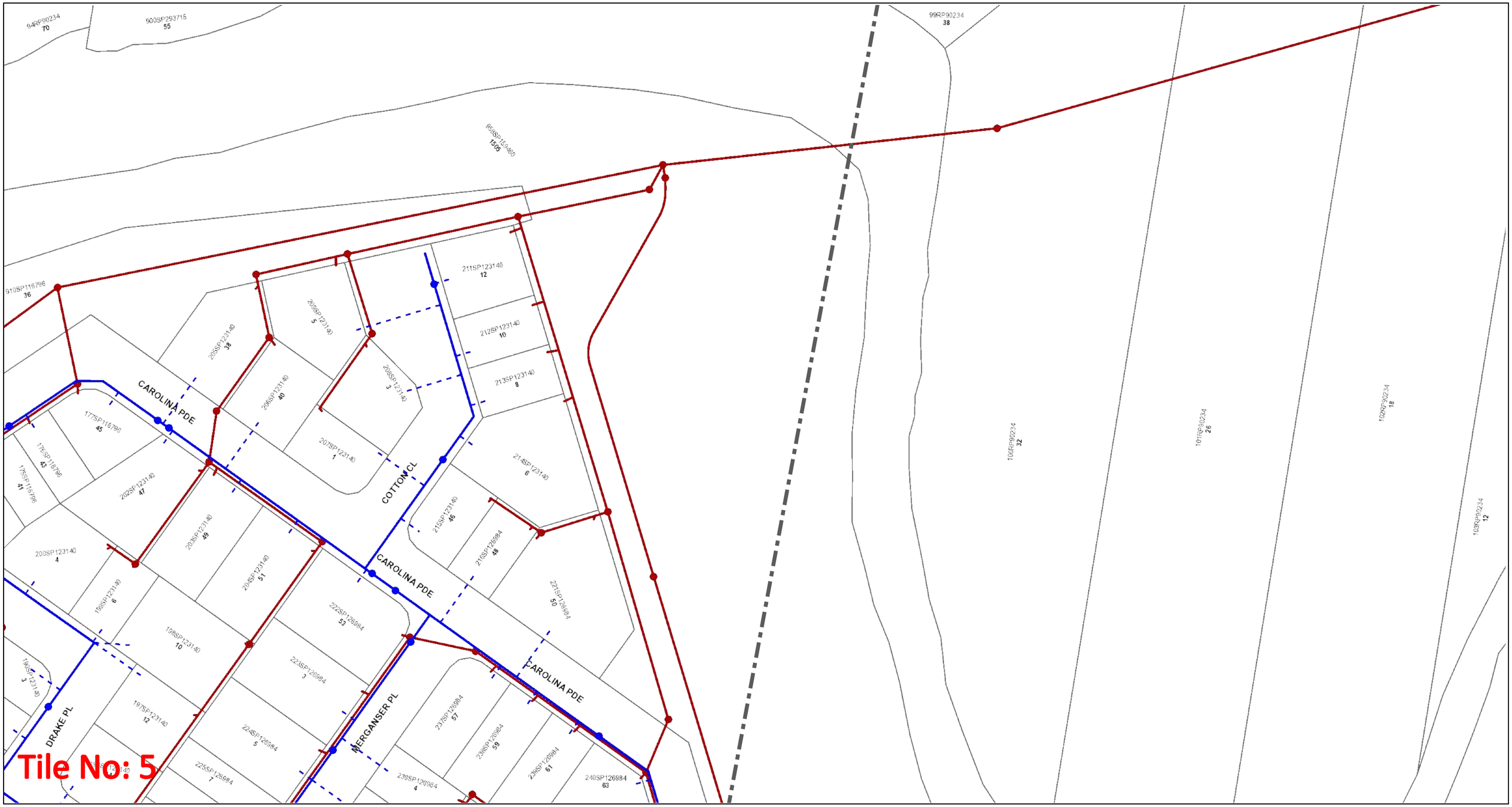
www.urbanutilities.com.au ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

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Date DBYD Job to Commence: 06/06/2022

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This Map is valid for 30 days

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N

Map Scale 1:1000

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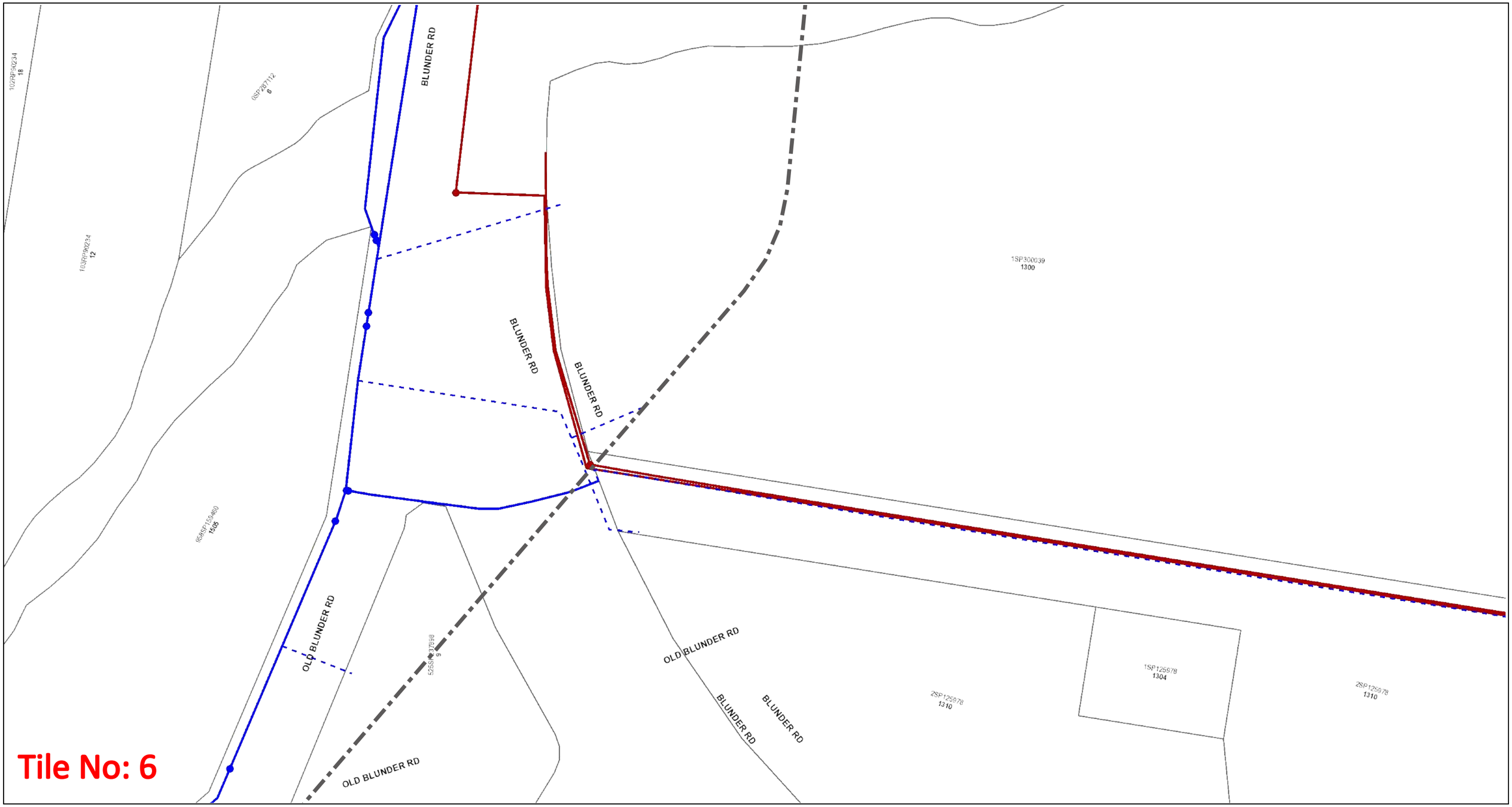
www.urbanutilities.com.au ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



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Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

UrbanUtilities

DBYD Reference No: 210917547

Date DBYD Ref Received: 03/05/2022
Date DBYD Job to Commence: 06/06/2022
Date DBYD Map Produced: 03/05/2022

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer
- Infrastructure
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- Network Structures

Water
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N

Map Scale 1:1000

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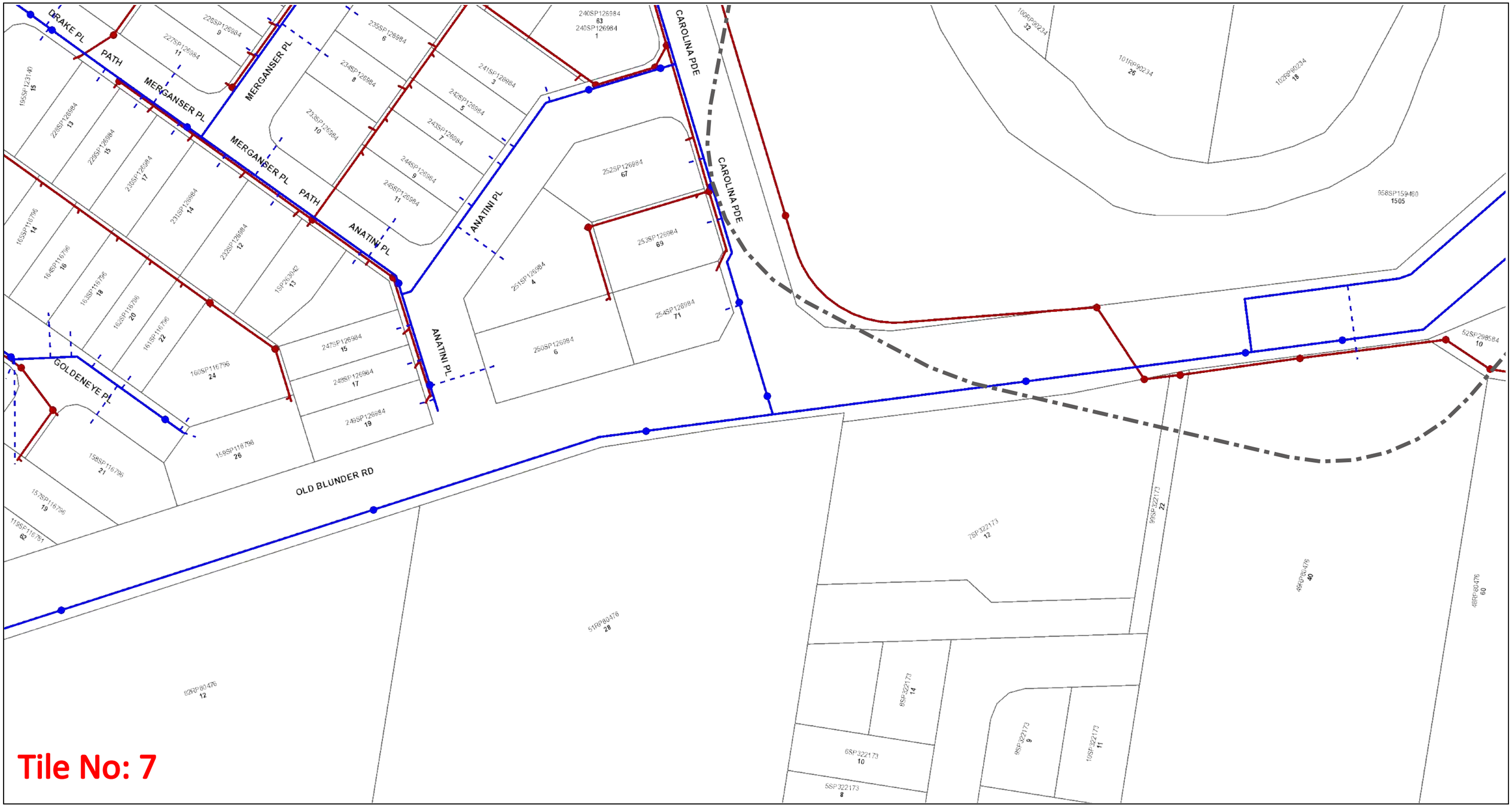
www.urbanutilities.com.au

ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

DBYD Reference No: 210917547

Date DBYD Ref Received: 03/05/2022

Date DBYD Job to Commence: 06/06/2022

Date DBYD Map Produced: 03/05/2022

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer
- Infrastructure
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Water
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N

Map Scale 1:1000

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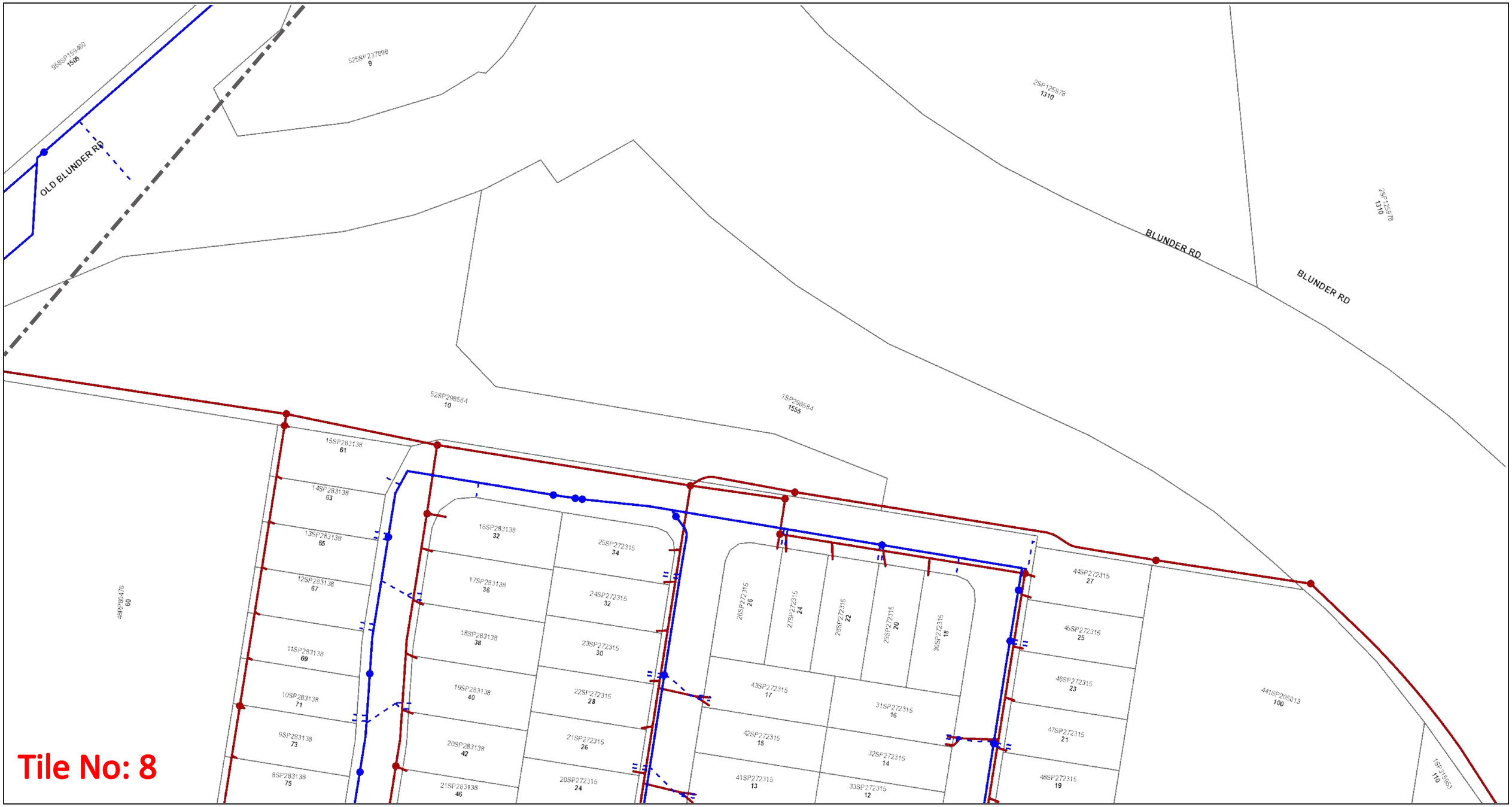
www.urbanutilities.com.au

ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



Tile No: 8

Dial Before You Dig - Urban Utilities Water, Recycled Water and Sewer Infrastructure

DBYD Reference No: 210917547

Date DBYD Ref Received: 03/05/2022

Date DBYD Job to Commence: 06/06/2022

Date DBYD Map Produced: 03/05/2022

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer

- Infrastructure
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- Network Structures

Water

- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures
- Water Service (Indicative only)

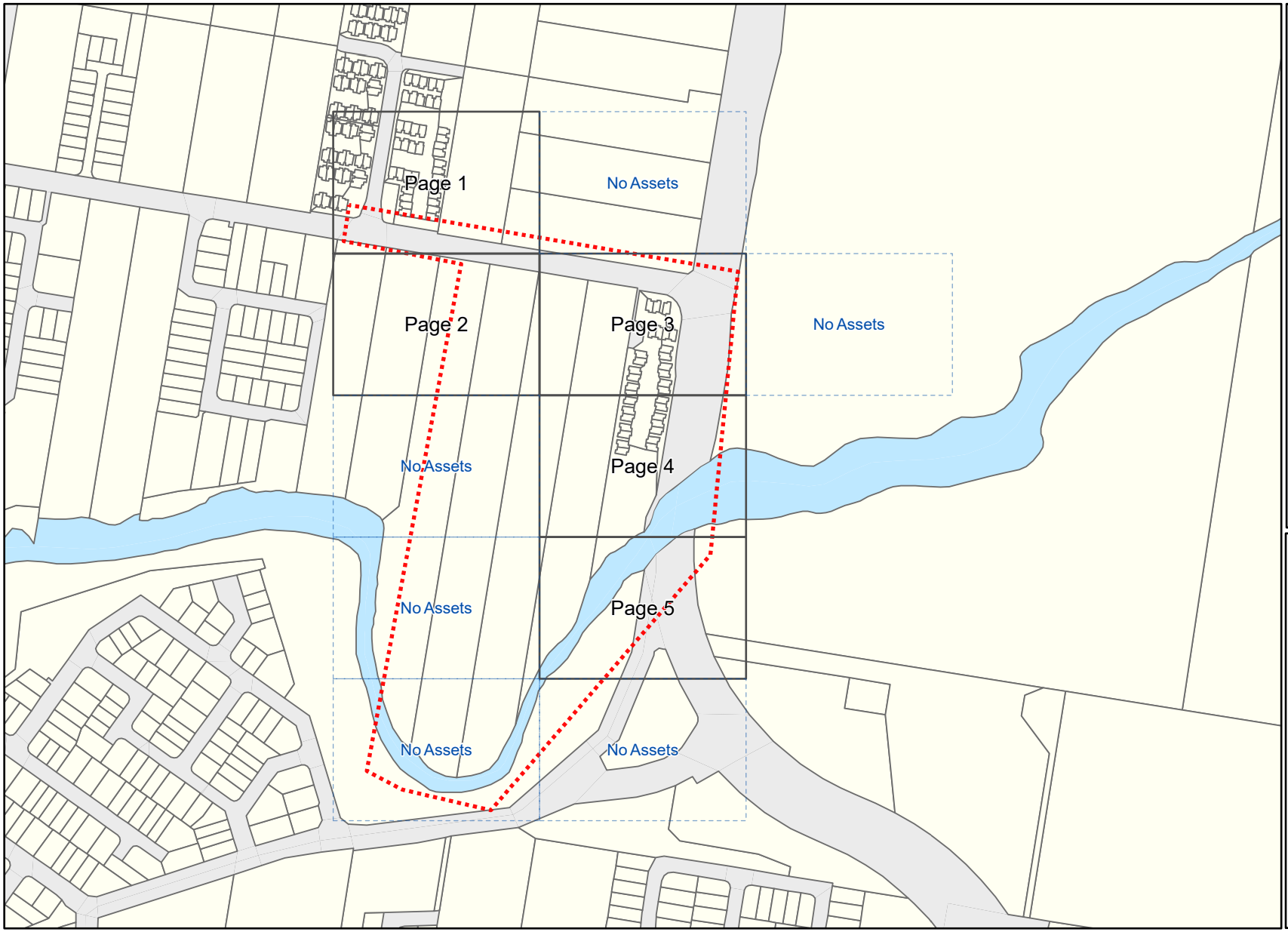
N

Map Scale 1:1000

For further information, please call Urban Utilities on 13 26 57 (8am-6pm weekdays). Faults and emergencies 13 23 64 (24/7).

www.urbanutilities.com.au ABN 86 673 835 011

Job # 31867272
Seq # 210917542
Provider: Brisbane City Council
Telephone: 07 3403 8888



Legend

- DBYD Enquiry
- Detailed map page
- No dig site assets

Caution: This map may contain the locations of abandoned underground asbestos pipes. Council gives no warranty to the completeness or accuracy of these records. Appropriate care needs to be taken in all cases.

In an emergency contact Brisbane City Council on 07 3403 8888

Index Sheet

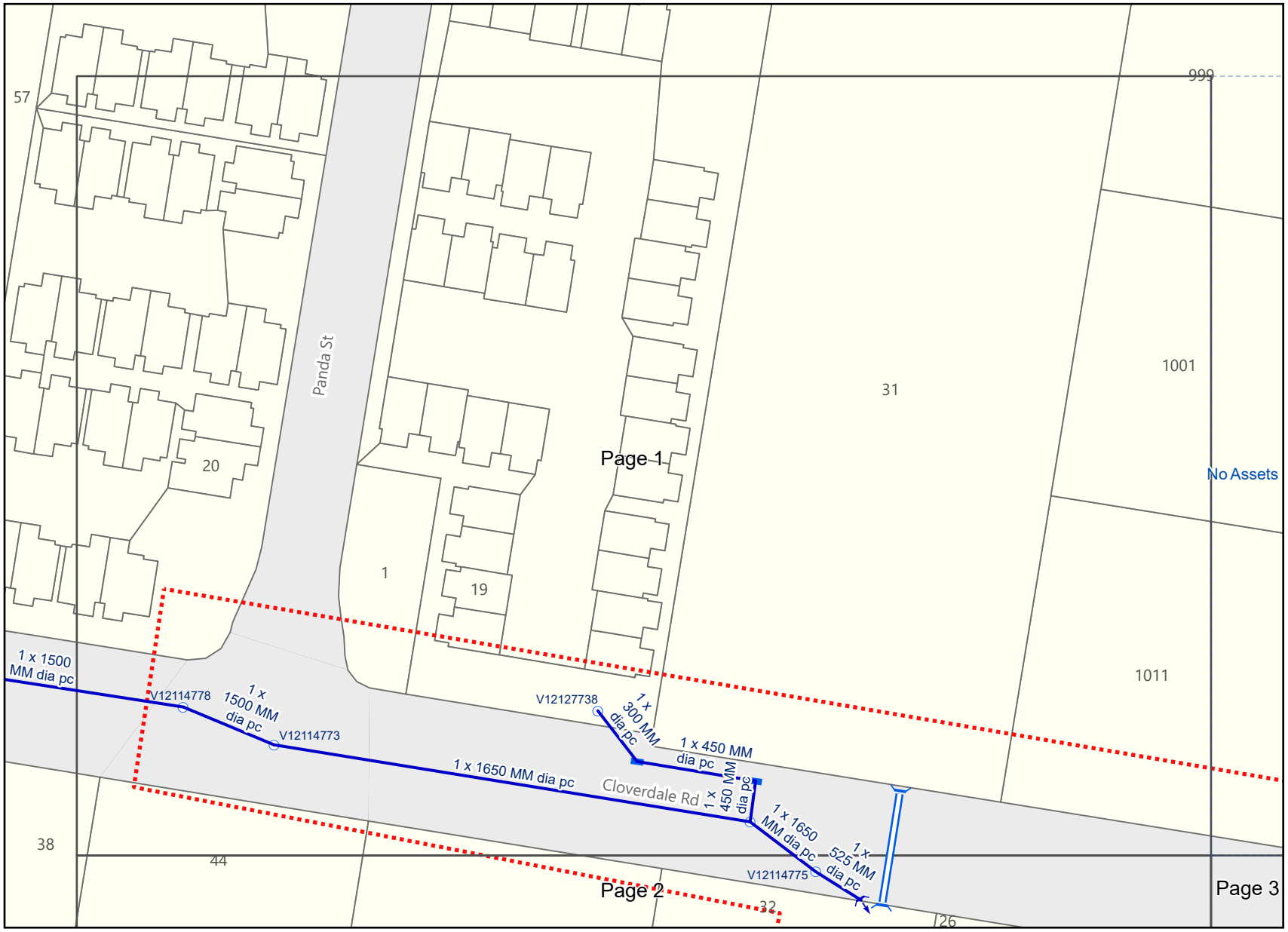
0 60 120 240 m

Scale 1:5,500

N

Plans generated by SmarterWX™ Automate

Job # 31867272
Seq # 210917542
Provider: Brisbane City Council
Telephone: 07 3403 8888



Legend

- DBYD Enquiry

Stormwater Network

- Stormwater Drain
- Stormwater Maintenance Hole
- Stormwater Gully Pit
- Stormwater Culvert
- Pipe End Outlet

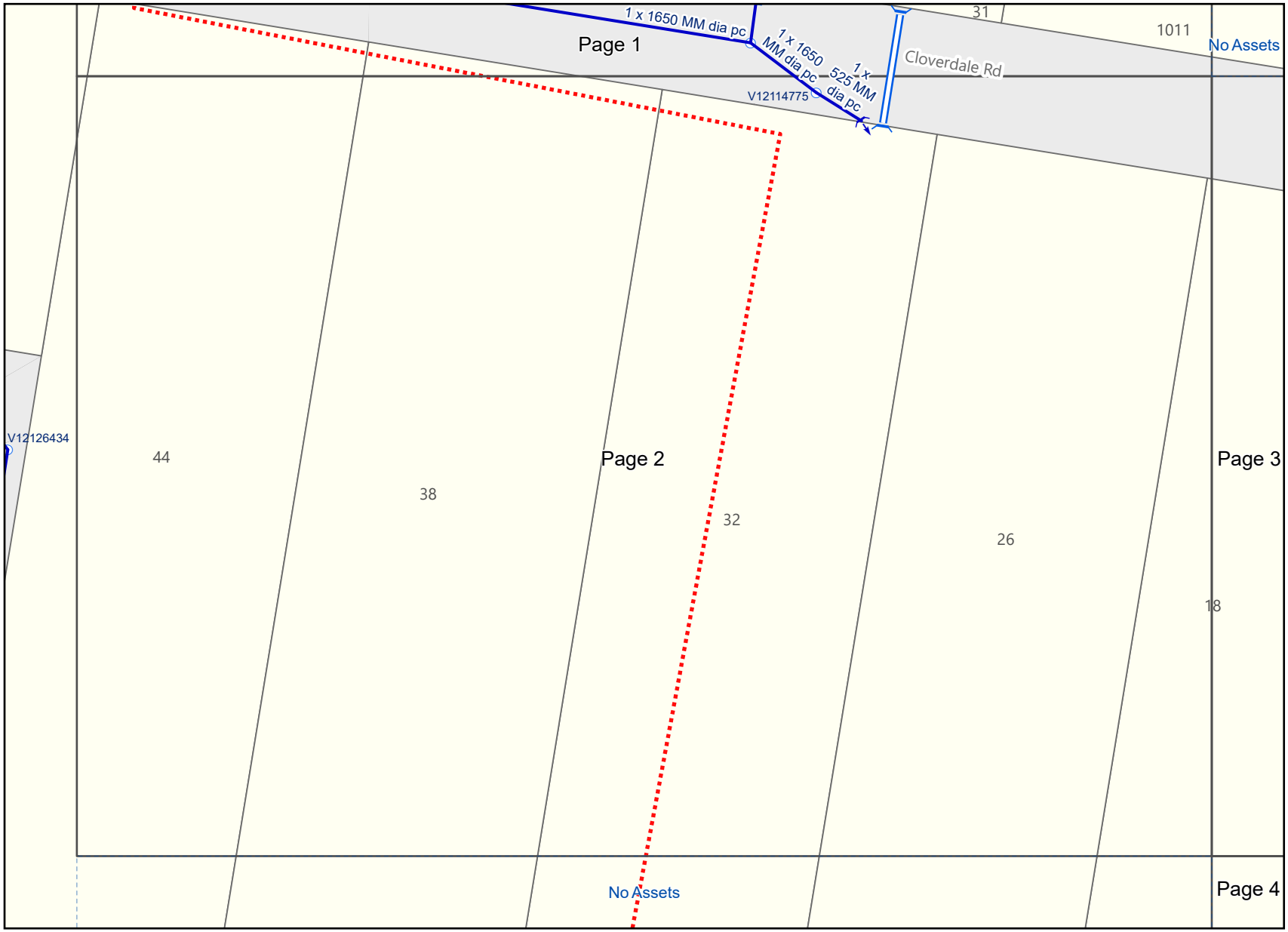
In an emergency contact Brisbane City Council on 07 3403 8888
03/05/22 (valid for 30 days)

0 10 20 40 m

Scale 1:1,000

Plans generated by SmarterWX™ Automate

Job # 31867272
Seq # 210917542
Provider: Brisbane City Council
Telephone: 07 3403 8888



Legend

DBYD Enquiry

Stormwater Network

- Stormwater Drain
- Stormwater Maintenance Hole
- Stormwater Gully Pit
- Stormwater Culvert
- Pipe End Outlet

In an emergency contact Brisbane City Council on 07 3403 8888
03/05/22 (valid for 30 days)

0 10 20 40 m

Scale 1:1,000

Plans generated by SmarterWX™ Automate

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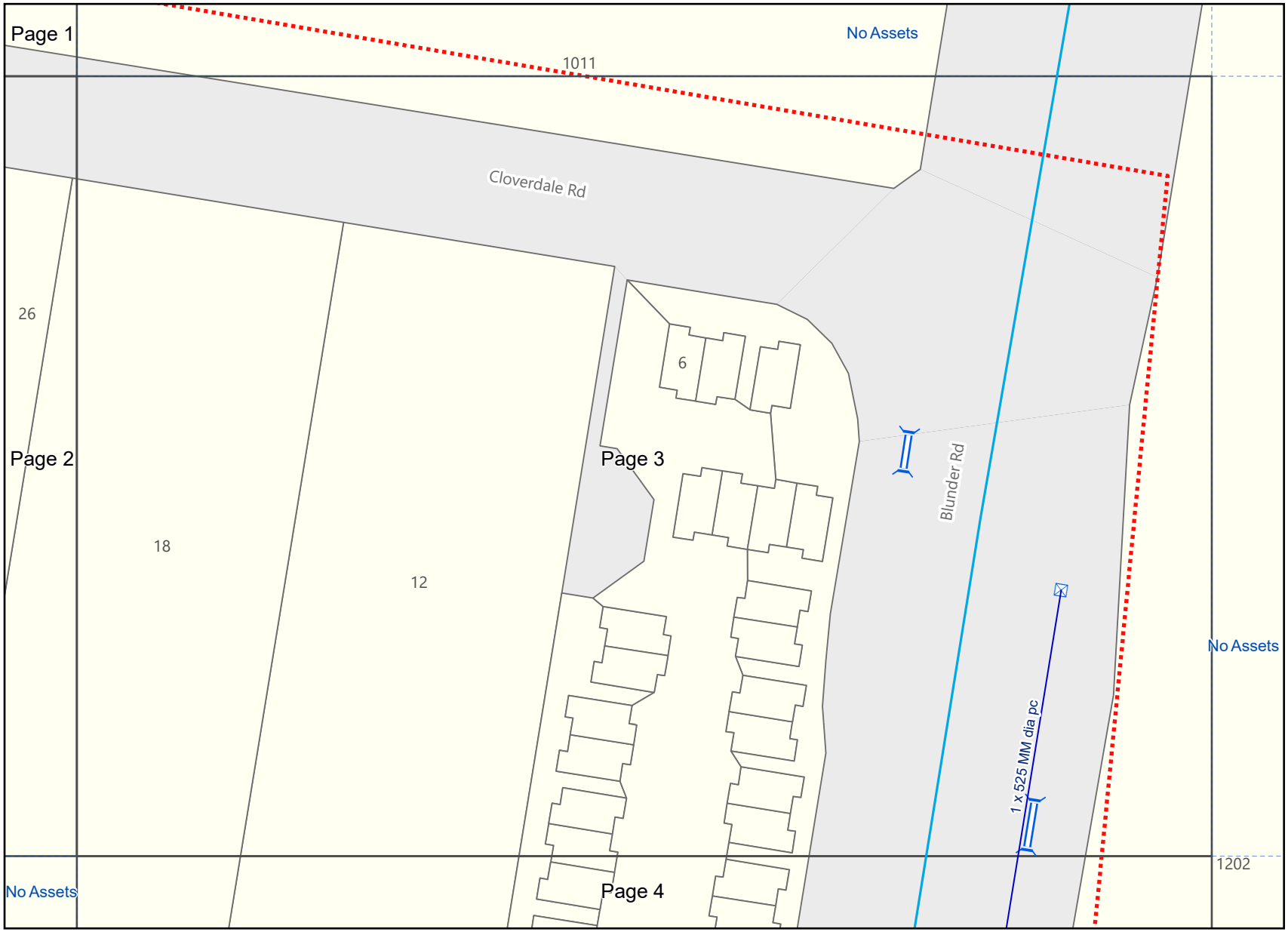


Legend

DBYD Enquiry

Stormwater Network

- Stormwater Gully / Roofwater Connection
- Stormwater Field Inlet
- Stormwater Culvert

BCC Cable Network

- Fibre Optic Cable Location

In an emergency contact Brisbane City Council on 07 3403 8888

03/05/22 (valid for 30 days)

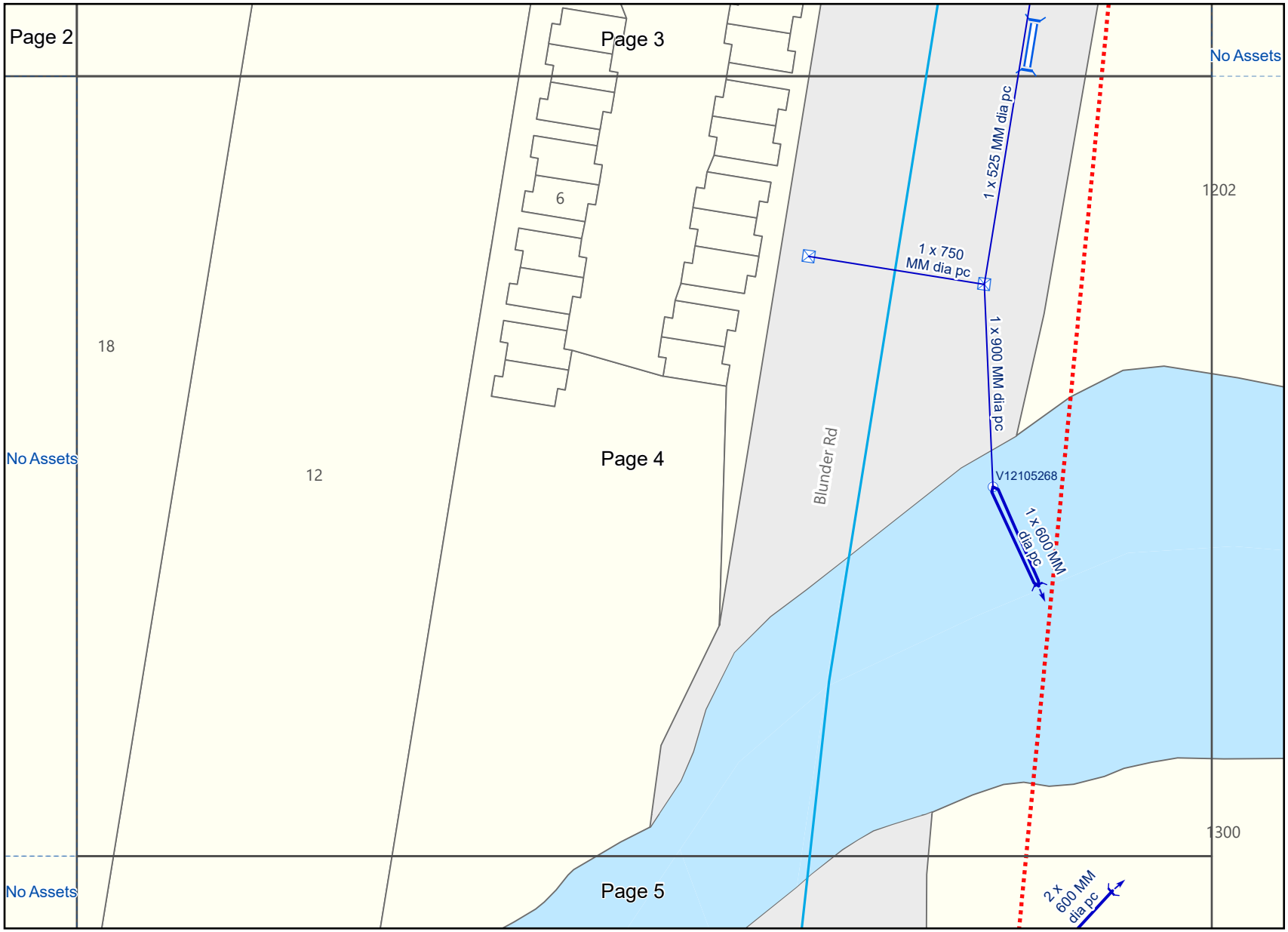
0 10 20 40 m

Scale 1:1,000

N

Plans generated by SmarterWX™ Automate

Job # 31867272
Seq # 210917542
Provider: Brisbane City Council
Telephone: 07 3403 8888



Legend

DBYD Enquiry

Stormwater Network

- Stormwater Drain
- Stormwater Gully / Roofwater Connection
- Stormwater Maintenance Hole
- Stormwater Field Inlet
- Stormwater Culvert
- Pipe End Outlet

BCC Cable Network

- Fibre Optic Cable Location

In an emergency contact Brisbane City Council on 07 3403 8888
03/05/22 (valid for 30 days)

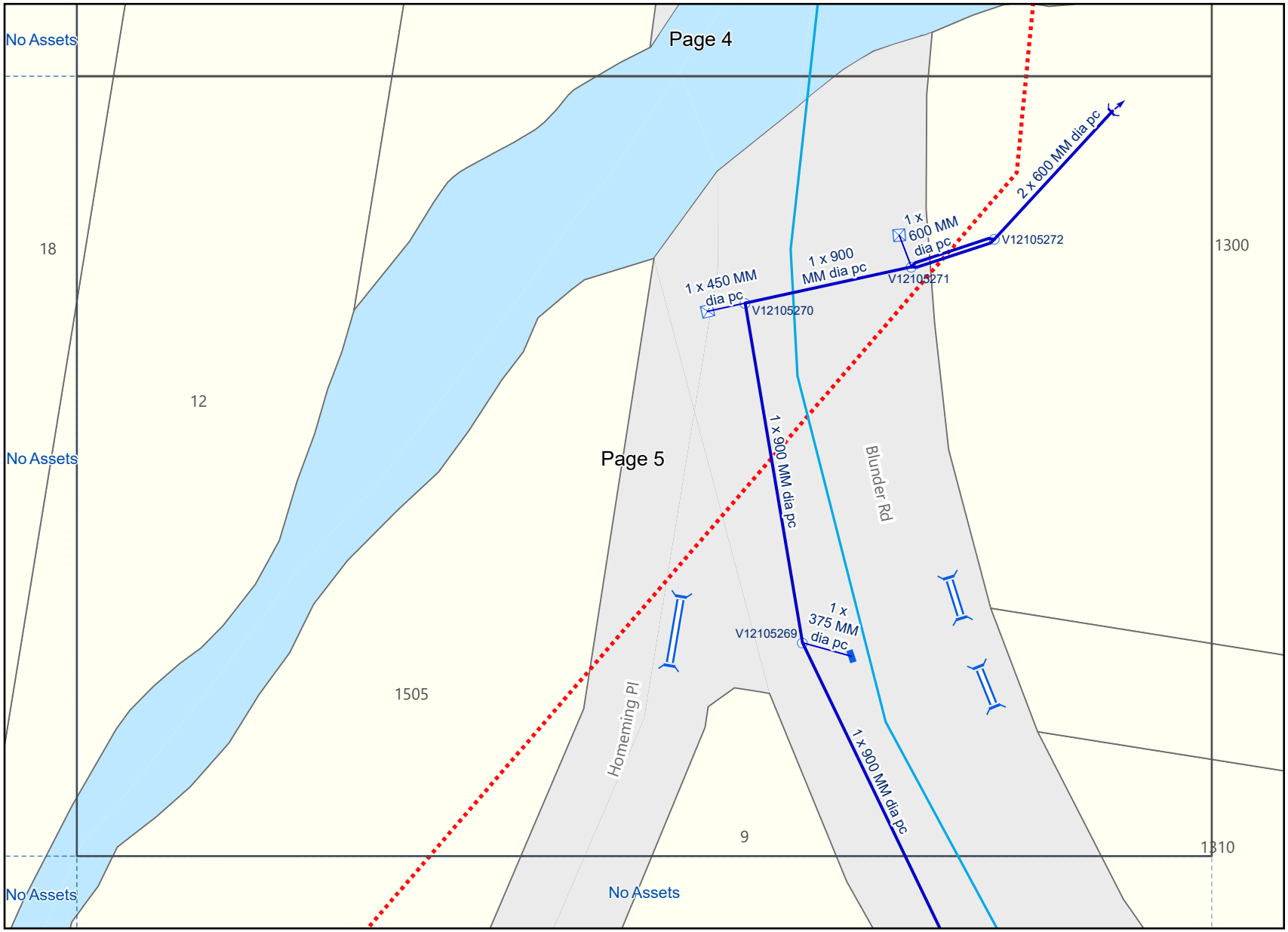
0 10 20 40 m

Scale 1:1,000

N

Plans generated by SmarterWX™ Automate

Job # 31867272
Seq # 210917542
Provider: Brisbane City Council
Telephone: 07 3403 8888



Legend

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Stormwater Network

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BCC Cable Network

- Fibre Optic Cable Location

In an emergency contact Brisbane City Council on 07 3403 8888
03/05/22 (valid for 30 days)

0 10 20 40 m

Scale 1:1,000

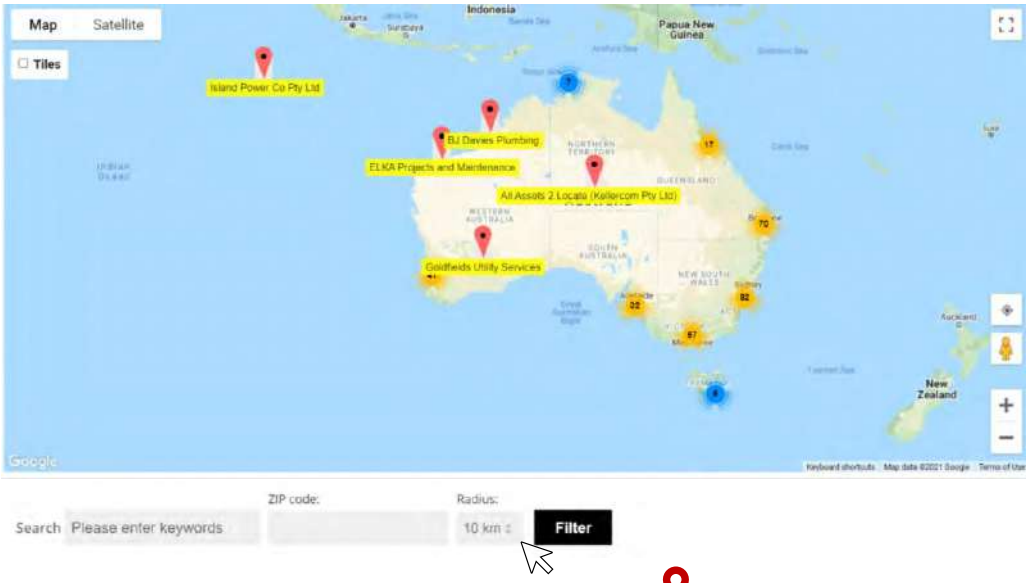
Plans generated by SmarterWX™ Automate

Certified Locating Organisations (CLO)

Find the closest CLO to your worksite on: https://dbydlocator.com/certified-locating-organisation/

Read the disclaimer and click: 

A national map and an A-Z list of Certified Locating Organisations is displayed.



Use the map to zoom to your work area and choose the closest Locator indicated.

OR search by entering the **postcode** of your work area.

1. **Enter the post/zip code**
2. **Choose your search radius**
3. **Click filter** (If there is no result, you may have to increase the search radius)
4. **Click on the closest for CLO details or view the results displayed below the map**

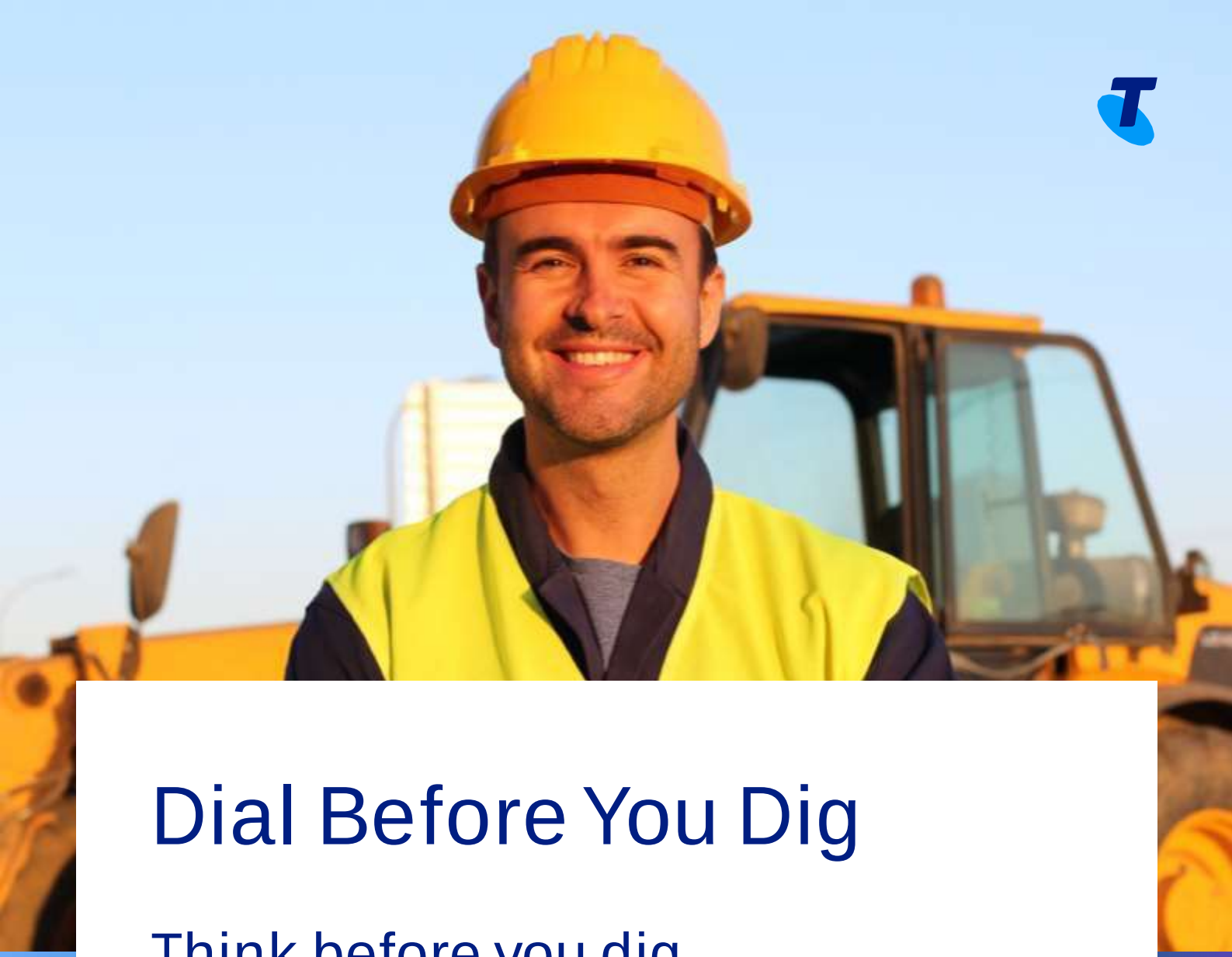
Locator skills have been tested, and the Organisation has calibrated location and safety equipment.

Telstra is aware of each Certified Locating Organisation and their employee locators.

Only a DBYD Certified Locator registered with a Certified Locating Organisation is authorised to access Telstra network for locating purposes.

Each Certified Locator working for a CLO is issued with a photo ID Card, authorising them to access Telstra pits and manholes for the purpose of cable and plant locations.

Please ask to see your Locators' CLO ID Card.



Dial Before You Dig

Think before you dig

This document has been sent to you because you requested plans of the Telstra network through Dial Before You Dig.

If you are working or excavating near telecommunications cables, or there is a chance cables are located near your site, you are responsible to avoid causing damage to the Telstra network.

Please read this document carefully. Taking your time now and following the steps below can help you avoid damaging our network, interrupting services, and potentially incurring civil and criminal penalties.

Our network is complex and working near it requires expert knowledge. Do not attempt these activities if you are not qualified to do so.

Your checklist

1. Plan

Plan your work with the latest plans of our network.

Plans provided through the DBYD process are indicative only*.

This means the actual location of our asset may differ substantially from that shown on the plans.

Refer to steps 2 and 3 to determine actual location prior to proceeding with construction.

2. Prepare

Engage a DBYD Certified Locating Organisation (CLO) via dbydlocator.com to identify, validate and protect Telstra assets before you commence work.

3. Pothole

Validate underground assets by potholing by hand or using non-destructive vacuum extraction methods.

Electronic detection alone (step 2) is not deemed to validate underground assets and must not be used for construction purposes.

If you cannot validate the Telstra network, you must not proceed with construction.

4. Protect

Protect our network by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm ploughing, Tree Removal
- 500mm Vibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant
- 1.0m Jackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

5. Proceed

You can proceed with your work only once you have completed all the appropriate preparation, potholing and protection.

Useful information

Report any damage immediately

https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

13 22 03

If you receive a message asking for an account or phone number say "I Don't have one"
Then say "Report Damage" then press 1 to speak to an operator.

Relocating assets

If your project requires the relocation of a Telstra asset, please contact the Telstra Network Integrity Group:

1800 810 443 (AEST business hours only)

NetworkIntegrity@team.telstra.com

Never try to move or alter our network infrastructure without authorisation. By law, only authorised people can work on our assets or enter a facility owned or operated by us. Any interference, including unauthorised entry or tampering, may result in legal action.

Further information

Plan enquiries

1800 653 935 (AEST business hours only)

Telstra.Plans@team.telstra.com

Information on how to find cables and request asset relocations:

https://www.telstra.com.au/consumer-advice/digging-construction

Asset Plan Readers

PDF Adobe Acrobat Reader DC Install for all versions
DWF Download Design Review | DWF Viewer | Autodesk

Disclaimer and legal details

*Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013.

It is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with telecommunications infrastructure.

Telstra will also take action to recover costs and damages from persons who damage assets or interfere with the operation of Telstra's networks.

By receiving this information including the indicative plans that are provided as part of this information package you confirm that you understand and accept the risks of working near Telstra's network and the importance of taking all of the necessary steps to confirm the presence, alignments and various depths of Telstra's network. This in addition to, and not in replacement of, any duties and obligations you have under applicable law.

When working in the vicinity of a telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

The Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas, then you must not attempt these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers. The 5 P's to prevent damage to Telstra assets are listed above. Construction activities and/or any activities that potentially may impact on Telstra's assets must not commence without first undertaking these steps. Construction activities can include anything that involves breaking ground, potentially affecting Telstra assets.

If you are designing a project, it is recommended that you also undertake these steps to validate underground assets prior to committing to your design.

This Notice has been provided as a guide only and may not provide you with all the information that is required for you to determine what assets are on or near your site of interest. You will also need to collate and understand all of the information received from other Utilities and understand that some Utilities are not a part of the DBYD program and make your own enquiries as appropriate. It is the responsibility of the entities undertaking the works to protect Telstra's network during excavation / construction works.

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Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.

Please ensure Telstra plans and information provided always remains on-site throughout the inspection, location, and construction phase of any works.

Telstra plans are valid for 60 days after issue and must be replaced if required after the 60 days.

Data Extraction Fees

In some instances, a data extraction fee may be applicable for the supply of Telstra information. Typically, a data extraction fee may apply to large projects, planning and design requests or requests to be supplied in non-standard formats. For further details contact Telstra Planned Services.

Telstra does not accept any liability or responsibility for the performance of or advice given by a Certified Locating Organisation. Certification is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.

Neither the Certified Locating Organisation nor any of its employees are an employee or agent for Telstra. Telstra is not liable for any damage or loss caused by the Certified Locating Organisation or its employees.

Once all work is completed, the excavation should be reinstated with the same type of excavated material unless specified by Telstra

The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

When using excavators and other machinery, also check the location of overhead power lines.

Workers and equipment must maintain safety exclusion zones around power lines

WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. The exact position of Telstra assets can only be validated by physically exposing them. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

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Your information has been provided to Telstra by DBYD to enable Telstra to respond to your DBYD request. Telstra keeps your information in accordance with its privacy statement. You can obtain a copy at www.telstra.com.au/privacy or by calling us at 1800 039 059 (business hours only).

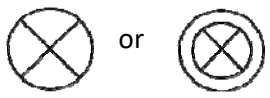
LEGEND

IT'S HOW WE CONNECT

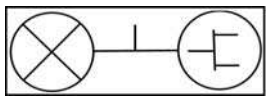
For more info contact a Certified Locating Organisation or Telstra Plan Services 1800 653 935

Exchange
(Major Cable Present)

Footway Access Chamber
(can vary from 1-lid to 12-lid)



Pillar / Cabinet
(above ground / free standing)



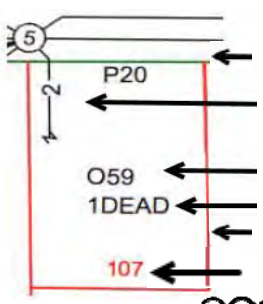
Above ground complex equipment housing (eg RIM)
Please Note: This equipment is powered by 240V Electricity

OC — Other Carrier Telecommunications Cable/Asset

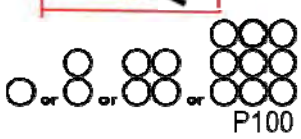
Dist — Distribution cables in Main Cable ducts

MC — Main Cable ducts on a Distribution plan

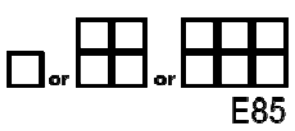
▲ — Blocked or damaged duct.



Roadside / Front Boundary
2 pair lead-in to property from pit in street 1
pair working (pair ID 059)
1 pair dead (i.e. spare, not connected)
Side / Rear Property Boundary
Property Number



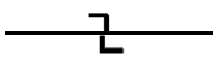
Single to multiple round conduit
Configurations 1.2.4.9 respectively
(attached text denotes conduit type and size)



Multiple square conduit
Configurations 2, 4, 6 respectively
(attached text denotes conduit type and size)

Cable Jointing Pit
(number indicating Pit Type)

Elevated Joint
(above ground joint on buried cable)

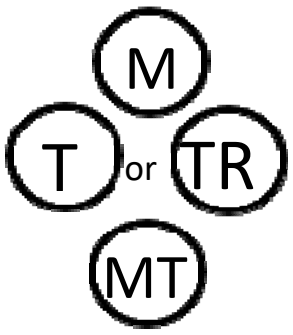


Telstra Plant in shared Utility trench

Aerial Cable

Aerial Cable
(attached to joint Use Pole eg. Power)

Direct Buried Cable



Marker Post Installed

Buried Transponder

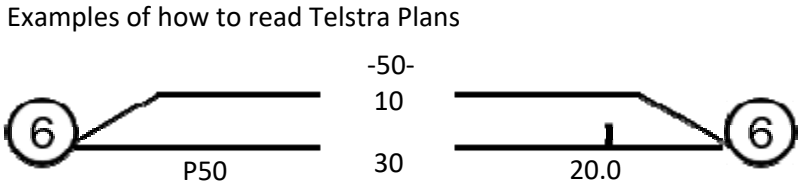
Marker Post, Transponder

Optical Fibre cable direct buried

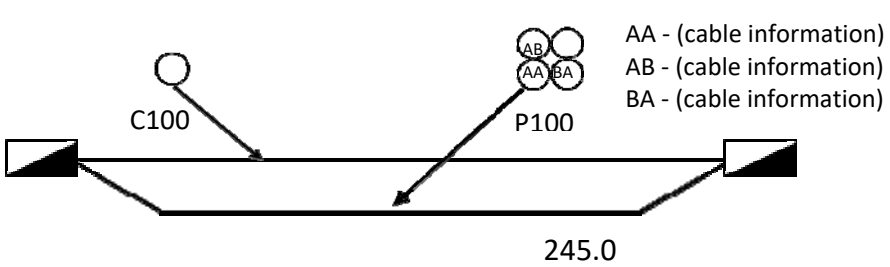
Some examples of conduit type and size:

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

Some Examples of how to read Telstra Plans



One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits. approximately 20.0m apart, with a direct buried 30-pair cable along the same route



Two separate conduit runs between two footway access chambers (manholes) approximately 245m apart A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

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GPO Box 2765
Brisbane QLD 4001

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You also agree that Urban Utilities does not assume any responsibility or duty of care in respect of, or warrant, guarantee or make any representation as to the Data (including its accuracy, reliability, currency or suitability).

Because the location of Urban Utilities' infrastructure shown on the Data is approximate only, you must first physically locate the infrastructure by utilising relevant site detection methodologies prior to performing any works or undertaking any activities near or adjacent to infrastructure. Possible site detection methodologies include hand digging, potholing, trenching and/or probing. You are solely responsible for the selection of appropriate site detection methodologies at all times.

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There may be both indicated and unmarked hazards, dangers or encumbrances, including underground asbestos pipes and abandoned mains within your nominated search area. You are solely responsible for ensuring that appropriate care is taken at all times and that you comply with all mandatory requirements relating to such matters, including in relation to workplace health and safety.

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Please note that it is an offence under Section 192 of the *Water Supply (Safety and Reliability) Act 2008* to interfere with our infrastructure without Urban Utilities' written consent.

You may be liable to Urban Utilities for any loss of or damage to our infrastructure, together with any consequential or indirect loss or damage (including without limitation, loss of use, loss of profits or loss of revenue) arising from or in connection with any interference with Urban Utilities' infrastructure by you or any other person for which you are legally responsible.

Any damage to Urban Utilities' Infrastructure must be reported immediately to the (24 Hours) Faults and Emergencies Team on 13 23 64.

Links

Technical Standards: https://urbanutilities.com.au/development/help-and-advice/standards-and-guidelines

Copyright

ABN 86 673 835 011

HYDRAULIC IMPACT ASSESSMENT

Proposed Residential Subdivision

12, 18 & 26 Cloverdale Road, Doolandella

Lots 101-103 on RP90234

For QLD International Investments Pty Ltd

5 June 2023

File No: K3426-0008-D

DOCUMENT CONTROL SHEET

Title:	Hydraulic Impact Assessment
Document No:	K3426-0008-D
Original Date of Issue:	13 December 2018
Project Manager:	Daley Curran
Author:	Ben Grant
Client:	QLD International Investments Pty Ltd
Client Contact:	Aileen Chem Alex Wu
Client Reference:	12, 18 & 26 Cloverdale Road, Doolandella
Synopsis:	This Hydraulic Impact Assessment Report provides details of the potential for hydraulic impact due to the Proposed Residential Subdivision premises of 12, 18 & 26 Cloverdale Road, Doolandella. It includes adopted modelling parameters, hydraulic constraints, conceptual design information and hydraulic impact for the proposed new lots and building pads.

Reviewed by RPEQ	Reg. No.	Signed	Date
Daley Curran	26353		5 June 2023

Revision/Checking History			
Revision No	**Date**	**Checked By**	**Issued By**
Original	13 December 2018	Blake Stephens	Kathryn McDonald
A	25 May 2020	Trent Purdon	Blake Stephens
B	23 June 2020	Trent Purdon	Blake Stephens
C	2 July 2020	Trent Purdon	Blake Stephens
D	5 June 2023	Daley Curran	Ben Grant

Distribution		
Recipient	**No of Copies**	**Method**
QLD International Investments Pty Ltd - Aileen Chem	1	Email
QLD International Investments Pty Ltd – Alex Wu	1	Email

The information contained within this report is provided in good faith in the belief that no information, opinions or recommendations made are misleading. All comments and opinions given in this report are based on information supplied by the client, their agent and third parties.

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Appendix E: OSKA Consulting Group, 1 in 50yr ARI (2% AEP) Flood Level Afflux Map
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1.0 INTRODUCTION

1.1 Background

OSKA Civil Consultants have been commissioned by QLD International Investments Pty Ltd to carry out a Hydraulic Impact Assessment (HIA) for a proposed 36 lot residential subdivision situated at 12, 18 and 26 Cloverdale Road, Doolandella.

This issue of the report (Issue D) has been generated due to an updated proposed subdivision layout and in response to the BCC Information Request (A006067610) dated 6 September 2022.

The subject site is described as Lots 101-103 on RP90234 and has a total site area of 6.34ha.

1.2 Scope

- This HIA aims to:
- Review and adopt the existing information and supplied survey;
- Provide detail of all assumptions obtained from the available and supplied information;
- Generate an existing model to quantify the existing flooding regime, flood levels and velocities within and surrounding the site;
- Provide conceptual details of the proposed subdivision;
- Assess the impact of the proposed conceptual subdivision layout on upstream flood levels and downstream discharge including the design inundation depths on surrounding infrastructure and properties; and
- Proposed mitigation options if required.

1.3 Description of Investigation Area

1.3.1 Location

The site is located along Cloverdale Road in Doolandella, Brisbane. The site occupies the lots 101 to 103 on RP90234 and has a total area of 6.34 hectares. The site is bounded along the western and eastern sides by already established properties. Cloverdale Road runs along the northern boundary and Blunder Creek marks the southern boundary.

The location of the subject site is shown in Figure 1.

Figure 1: ***Locality Plan (*****Source: Nearmap accessed on 1 December 2022)**

1.3.2 Existing Site

The site consists of 3 existing residential lots. The existing lots are primarily comprised of dense bushlands and trees to the south and cleared open grassed areas to the north along Cloverdale Road where the three existing residential dwellings are situated. Spot heights on site range from 24.4m AHD (in the north along Cloverdale Road) to 15m AHD (to the south along Blunder Creek) with any stormwater runoff on the site draining south/south-east into the existing drainage channel or Blunder Creek.

Further information of the site survey has been provided by TERRAMAP, Survey and Proposed Subdivision (Ref: 3814006) included as Appendix A.

1.3.3 Proposed Development

The proposed development for the subject site consists of a 40 lot residential subdivision. Access to the site will be gained from the north via Cloverdale Road which will provide access to the internal road reserve.

Refer to Appendix B for further proposed layout details prepared by Intrax, Proposed Reconfiguration of Lot.

2.0 MODELLING APPROACH

In order to assess the potential for flood hydraulic impact caused by the proposed development, a hydraulic impact assessment is required. An XPSWMM model was developed from available existing information. The following section details the modelling approach adopted.

2.1 XPSWMM Model

XPSWMM is a comprehensive Hydrologic and Hydraulic modelling software that combines 1D calculated flow with 2D overland flow calculations.

2.2 Adopted Model Technical Parameters

A summary of the key technical parameters adopted within the model are presented below.

Model Extent

The XPSWMM model extent is illustrated in Figure 2. The model extent surrounds the site and covers an approximate area of 0.5 km^2. The model extent was defined with a 3m grid mesh. The 3m grid size sets the precision of the model inputs and in turn the definition of the results. The finer the grid allows for greater detail represented in the model.

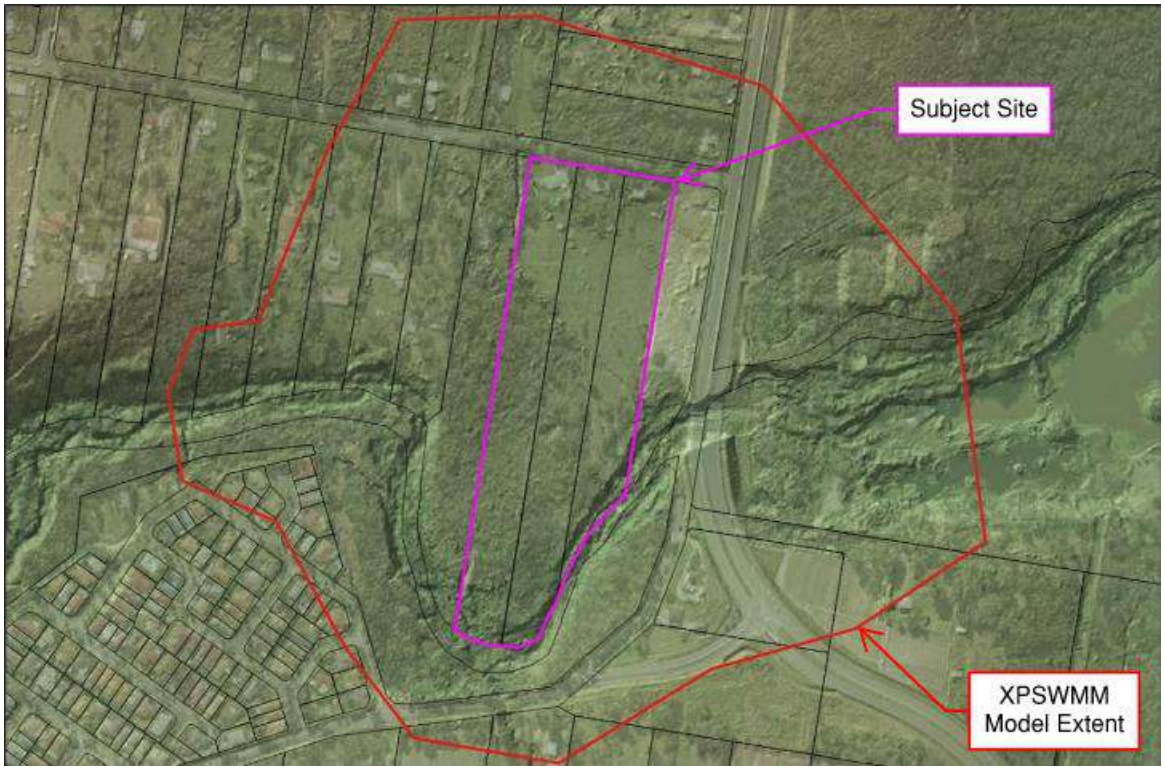

Figure 2: XP-SWMM Model Extent and DEM

Topography

The topographic elevation data utilised in the XPSWMM model was obtained from the online website ELVIS. ELVIS is an online database of elevation spatial data. The available data obtained from ELVIS included the digital elevation model (DEM) derived from Brisbane City Councils 2014 LiDAR DEM at a very high resolution (1m grid) for the entire model domain (including the site). Refer to Figure 2 for a localised view of the DEM across the site.

Boundary Conditions

The XPSWMM model has five inflow locations, as seen in Figure 3. The Blunder Creek inflow data was obtained from Volume 1 of the *Oxley Creek Flood Study*, prepared by Aurecon for Brisbane City Council. The Blunder Creek 1 in 100yr ARI (1% AEP) flood flow data was used as the inflow in the model to simulate the flooding conditions of Blunder Creek. The 1% AEP flows were used in accordance with the minimum design levels for Creek/waterway flow in the BCC City Plan. The 1% AEP Blunder Creek inflow hydrograph is presented in Figure 4.

The delineation of catchments 1 through 4 was undertaken as part of the XPSWMM model. The resulting hydrographs of the XPSWMM hydrologic model are shown in Figure 5.

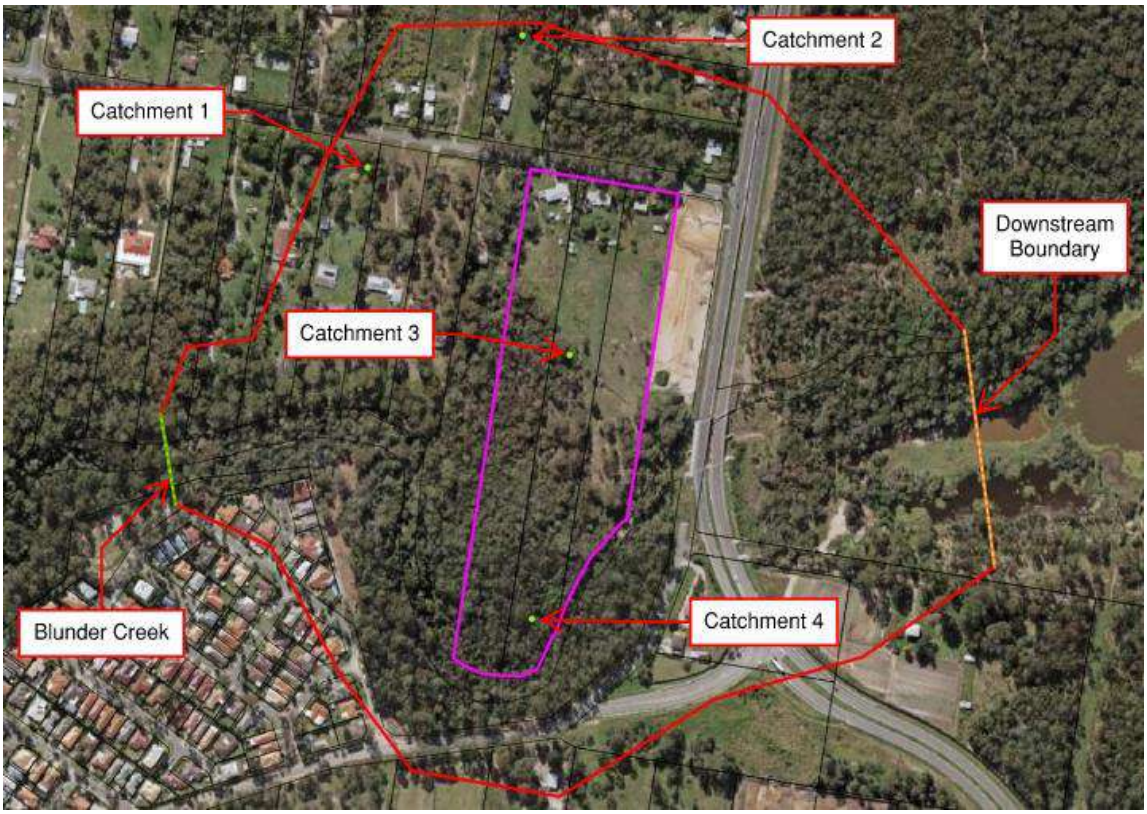

Figure 3: XPSWMM Model Catchments, Inflow and Downstream Boundary Locations

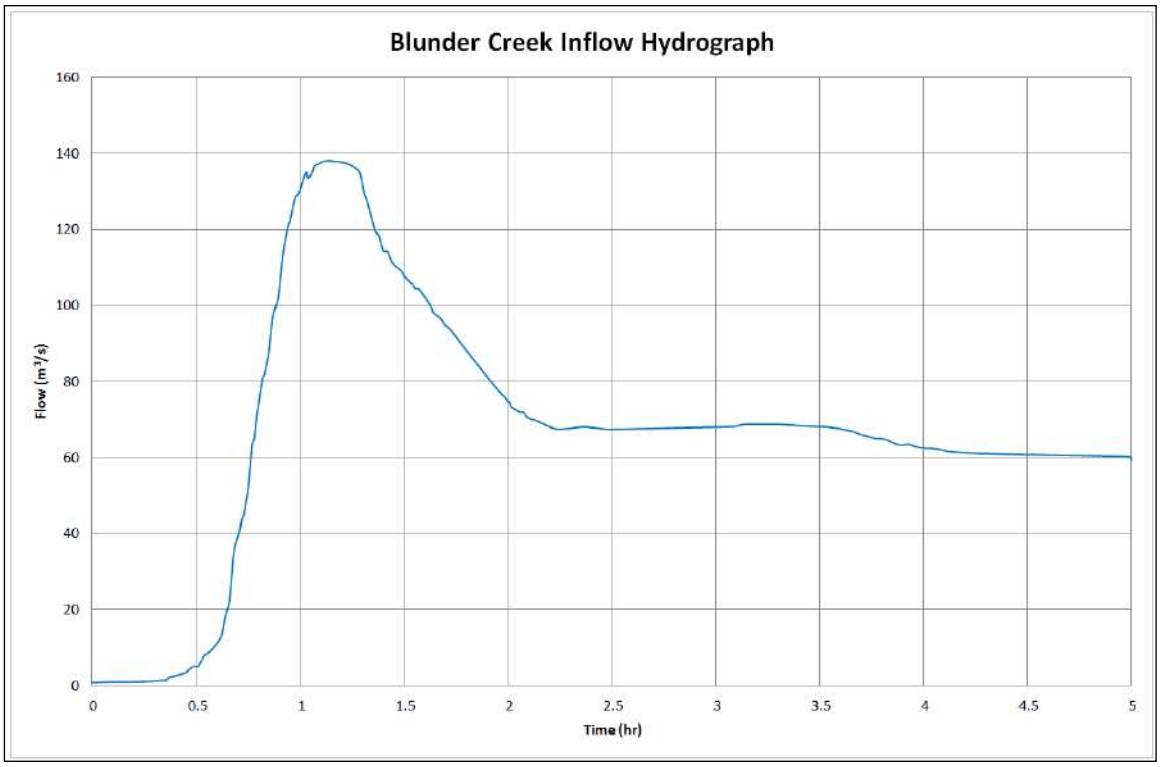

Figure 4: Blunder Creek 1% AEP Inflow Hydrograph

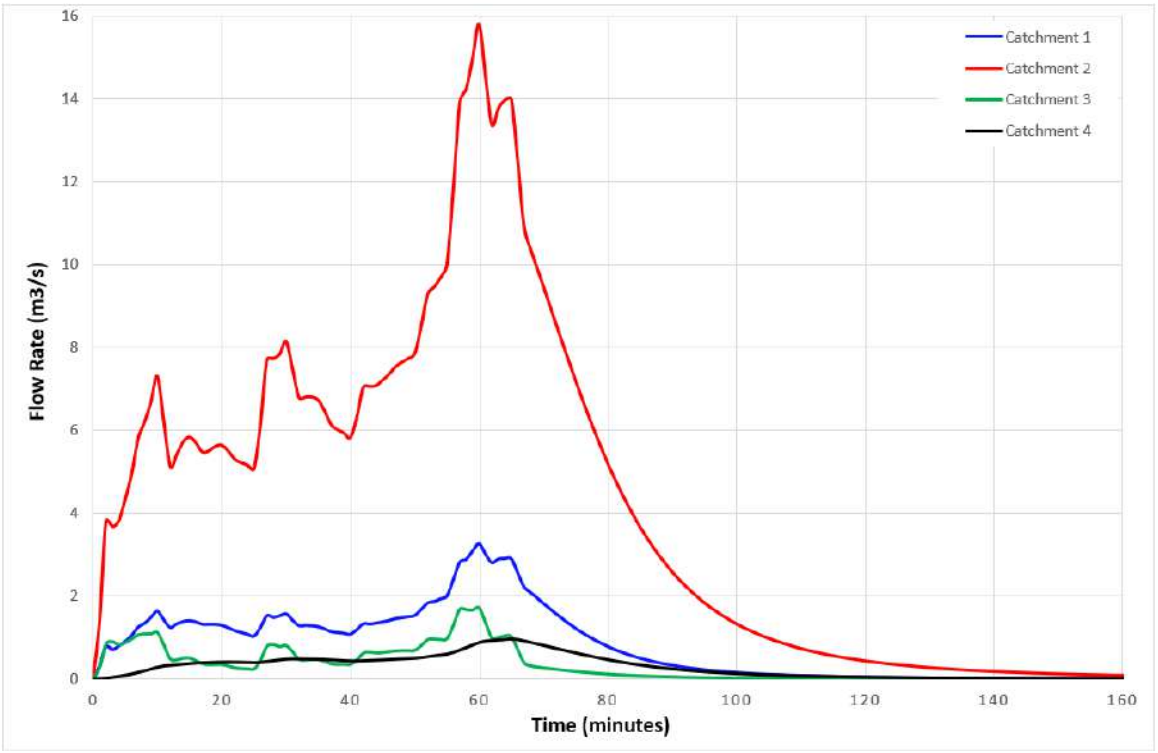

Figure 5: Catchment Inflow Hydrographs

The downstream boundary was set as a HQ boundary, water level versus flow (stage-discharge) curve. XPSWMM automatically generates a HQ boundary with the allocation of a downstream boundary slope. The downstream boundary slope was calculated as 0.005m/m. It should be noted that the tailwater boundary was 400m downstream of the site and sensitivity analysis suggested that there was no influence to the sites flood levels. Figure 3 also illustrates the location of the downstream boundary.

Manning's 'n' Hydraulic Roughness Coefficient

The adopted Manning's 'n' surface roughness coefficients, from recommendations in AR&R (2016), for various surface characteristics are shown below in Table 1.

Table 1: Manning's 'n' Roughness Coefficients

Materials Layer	Manning's	Impervious %
Dense Vegetation	0.050	0
Buildings	0.050	100
Low Vegetation	0.030	0
Road Pavement	0.013	100

Design Rainfalls

The design rainfall patterns and intensities for the catchment were determined using the procedures given in the Australia Runoff & Rainfall 2019 (ARR 2019). The 2% AEP rainfall intensities were used for the model in accordance with the minimum design levels for Overland Flow in the BCC City Plan.

Rainfall Losses

The model losses adopted in the XP SWMM hydrologic model are outlined below. A uniform initial and continuing loss was adopted and applied to all the pervious areas.

- Initial loss = 0 mm
- Continuous loss = 2.5 mm/hr

Only a uniform initial loss was applied to impervious areas.

- Initial loss = 0.5 mm
- Continuous loss = 0 mm/hr

2.3 Hydraulic Model Simulation

The XPSWMM model was run for the existing scenario to obtain the existing flow regime and to understand pre-developed conditions on site and external. A post-development model was set up representing the proposed 40 lot subdivision development including entry roads and access ramps. This has been discussed further in the following sections.

The 1 in 50yr ARI (2% AEP) 60min results are the primary results discussed and presented within this report, in accordance with Overland Flow requirements specified in the BCC Flood Hazard Overlay Code.

3.0 HYDRAULIC ASSESSMENT

A hydraulic assessment was undertaken to establish pre-development flood extents/flow paths, flood levels and flood velocities across the site for the 1 in 50yr ARI (2% AEP) 60min design event. The hydraulic assessment will also quantify any potential impacts caused by the proposed dwelling on peak flood levels within and external to the site. The following section describes the pre and post-development hydraulic model setup and results of the modelling.

3.1 Hydraulic Results

3.1.1 Existing Scenario

As described in Section 2, the XPSWMM model was built to assess the site and its surrounds from available existing information. The model was considered calibrated as it adopted inflow data obtained from Aurecon outlined in Volume 1 of their Oxley Creek Flood Study. Therefore, the model was validated and used for development assessment purposes.

A graphical representation of the 1 in 50yr ARI (2% AEP) pre-development flood levels, velocities and hazard (depth-velocity output) for the model are presented in Appendix C.

Results of the 1 in 50yr ARI (2% AEP) model indicates an average 140m wide flow path across the subject site. In the vicinity of the site the pre-development model estimated a varying flood depth over the site of up to 3.90m (located along the southern boundary within Blunder Creek).

Existing ground levels for the site range from approximately 15m AHD to 24.4m AHD, with a resulting 1 in 100yr ARI (1% AEP) designated flood level (DFL) for the site of between 19.70m AHD to 20.70m AHD. The peak flood levels at the site extracted from the BCC FloodWise property reports (12, 18 & 26 Cloverdale Road) are listed in Table 2 and the individual FloodWise Property Reports are included within Appendix H.

Table 2: Peak Flood Levels on the Site (Source: BCC FloodWise Property Report)

Event (% AEP)	Peak Existing Flood Level (m AHD)
20	19.30
5	19.80
2	20.10
1	20.70

A graphical representation of the 1% AEP existing flood levels and depths are presented respectively in Figures 6 and 7.

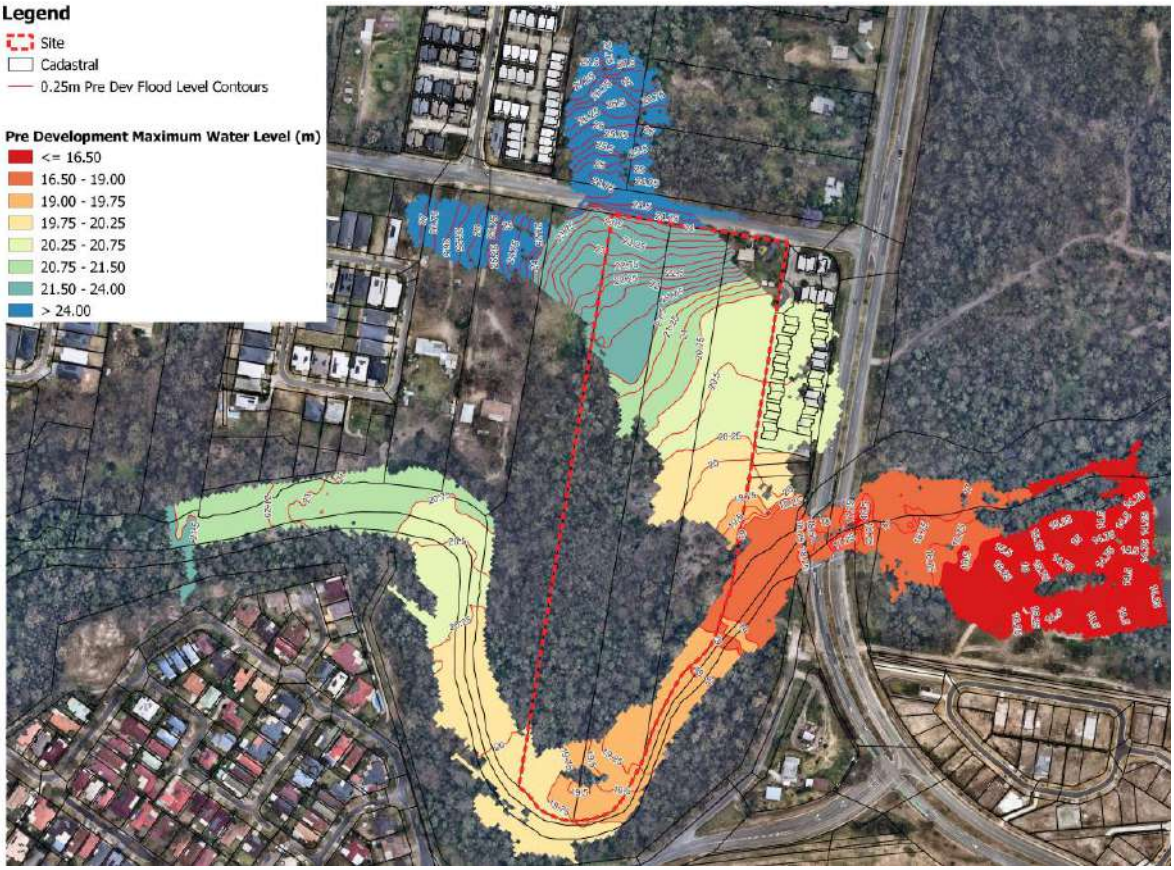

Figure 6: 2% AEP Pre Development Flood Levels

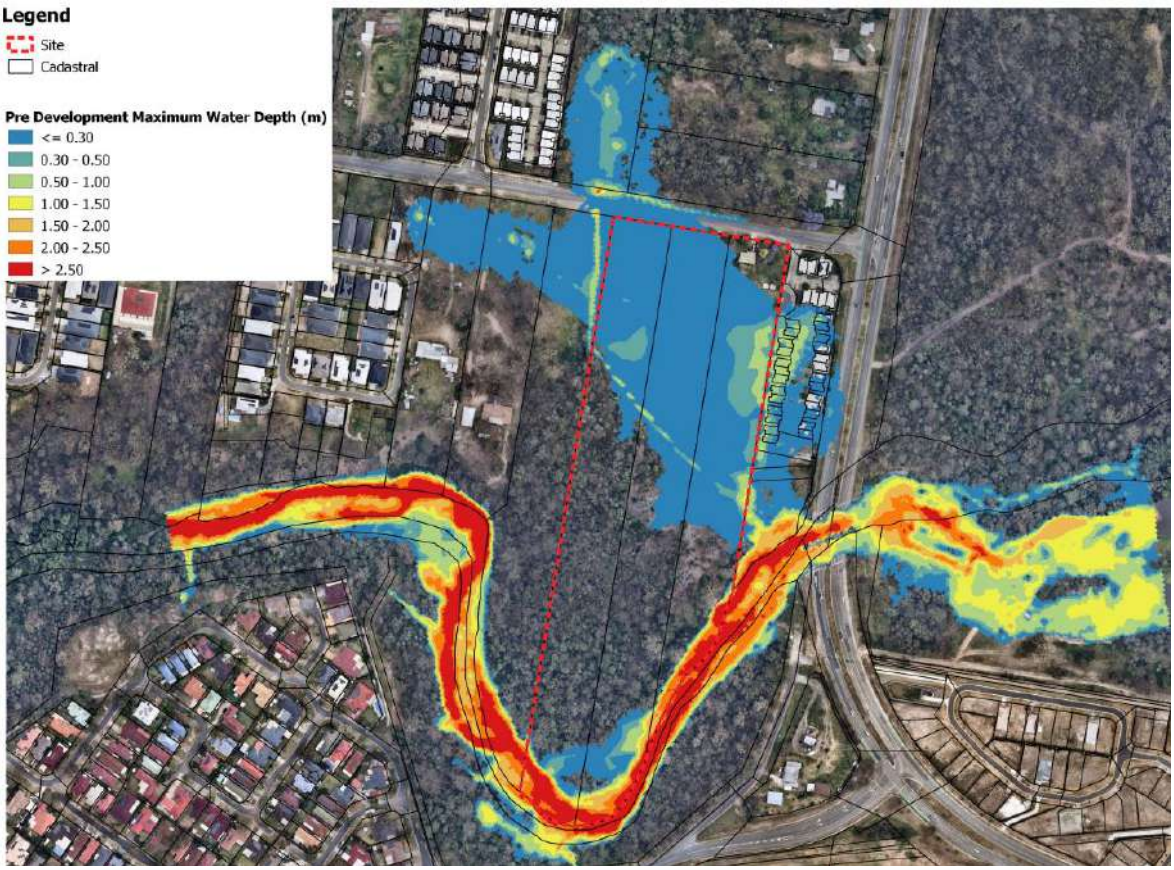

Figure 7: 2% AEP Pre Development Flood Depths

Based on the results of the 2% AEP existing model, the estimated maximum flood depth and flood velocity over the site are approximately 1.22m and 3.34m/s, respectively. Currently, the majority of the subject site and existing development to the east is inundated during the 2% AEP flood event.

The current overland flow flooding scenario inundates the existing townhouse development to the east as seen in Figure 6 and 7 and closely resembles the BCC Flood Awareness Map shown in Figure 8. The current flooding conditions for the existing development to the east may not have been considered during the original development approval and as such this development to remove/reduce the flooding impact on the site to correct any potential oversight that may have occurred as part of previous approvals.

It is to be noted that with the predevelopment flooding extent from the constructed XP-SWMM model closely resembling the overland flow overlay in the BCC Flood Awareness Map, the results from the constructed XP-SWMM model have been verified and as such, provides validation that the XP-SWMM model has been prepared with similar modelling assumptions.

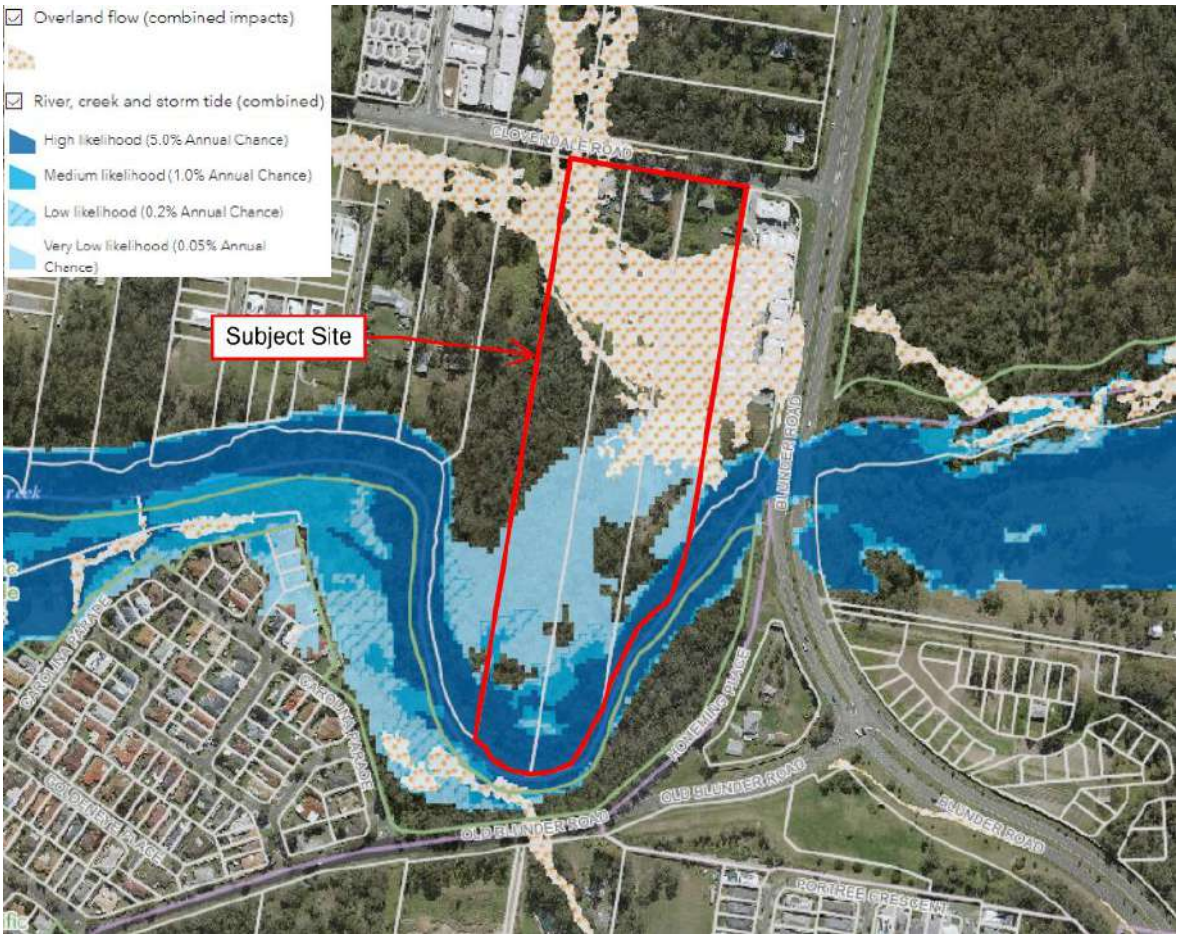

Figure 8: **BCC Flood Awareness Map (Source: BCC)**

3.1.2 Post Development Scenario

In order to assess the potential for hydraulic impact, the proposed 36 lot subdivision and associated drainage and driveway access infrastructure (to supply safe trafficable access to the development and rear of the site) has been included.

The proposed drainage infrastructure includes (see Figure 9):

- 7m wide drainage channel (along the northern boundary);
- The provided 10m wide easement (along the western boundary) has given adequate space for 10m wide drainage channel;
- 2 sets of circular culvert crossings, in the north underneath the access driveway (1 x 900mm) and south underneath the rear access driveway ramp (4 x 900mm) with the proposed culvert arrangement shown in Figure 9. These proposed culverts may also be in the form of a small private bridge or equivalent;
- 4m wide existing natural drainage channel within the western neighbouring lot and along the southern boundary of the development – this channel ties into a proposed 11m wide drainage channel in the south-east;
- 6m wide drainage channel running along the southern part of the proposed development – this channel ties into a proposed 11m wide drainage channel in the south-east;
- 11m wide drainage channel – this channel connects the 4m wide existing natural drainage channel and proposed 6m wide drainage channel together and disperses over a 56.80m area at the downstream end (south-east corner);
- Driveway access to the development is provided from Cloverdale Road; and
- Driveway access to the rear of the site is provided.

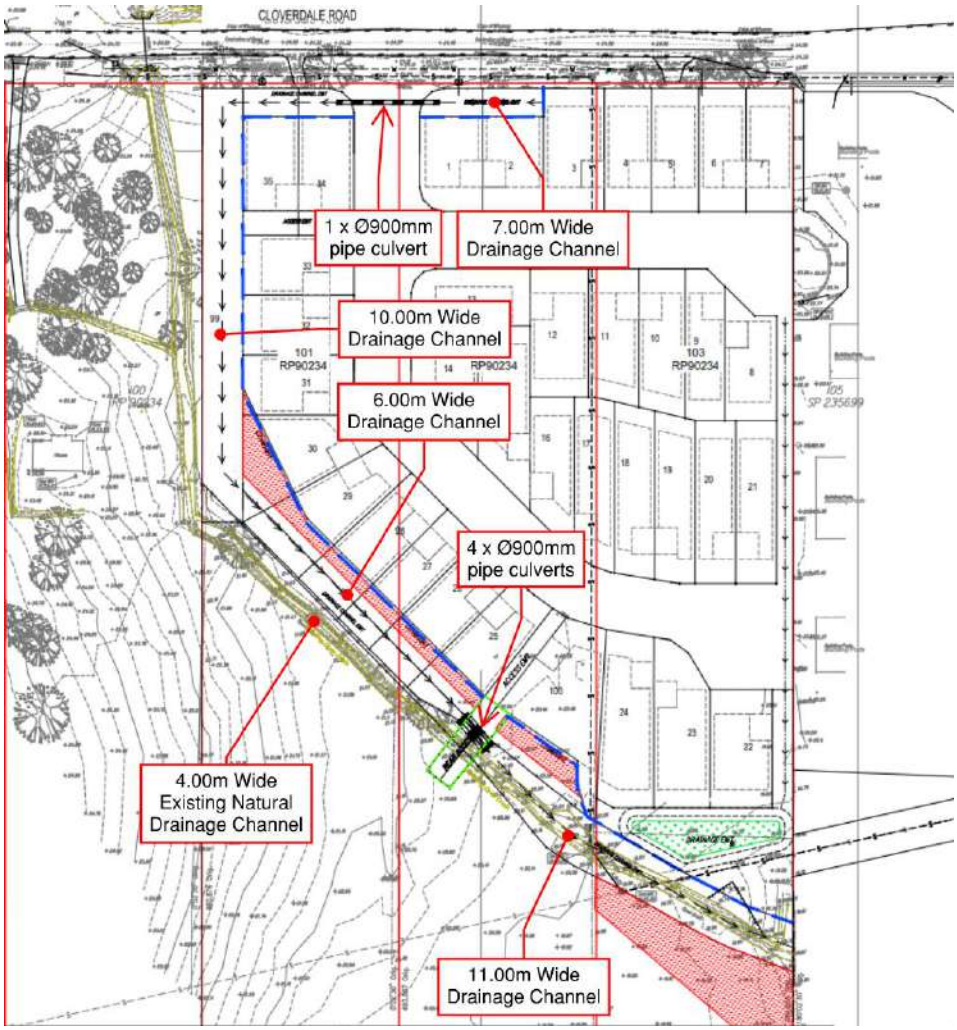

Figure 9: Post-Development Flood Model Proposed Drainage Infrastructure

In order to maintain the existing flood conveyance across the site, the majority of the existing natural drainage channel has been maintained and new drainage channels have been proposed (along the northern, western and southern side of the proposed development) with varying widths being implemented. The proposed driveway access roads were also designed in accordance with the BCC Flood Overlay Code. The level of the access driveway from Cloverdale Road and the access driveway to the rear of the site were both set above the design flood event, 1 in 50 year ARI (2% AEP), flood level. Careful consideration was given to the proposed drainage infrastructure with respect to the existing flood extent and overland flow path, and as a result, minimal change to the existing flood regime was shown in the resulting water level afflux plots described in Section 3.1.3.

The proposed development will alter the site's topology to meet Council's requirements for finished floor levels. The proposed development is to comply with BCC's Flood Overlay Code which is addressed in OSKA Consulting Group, *Flood Overlay Code* (Ref: K3426-0009) included as Appendix G.

The proposed development will also aim to reduce the current overland flow flooding extent within the existing townhouse development to the east. This will be achieved through the use of overland flow channels to convey the external upstream catchments flows around the proposed and existing development and discharged out to Blunder Creek to the south-east. Further information on the post development model results and flooding extents is provided in Appendix D.

HYDRAULIC RESULTS

A graphical representation of the 2% AEP Post Development flood levels, depths, velocities and depth*velocity product (D*V) are presented respectively in Figures 10, 11, 12 and 13.

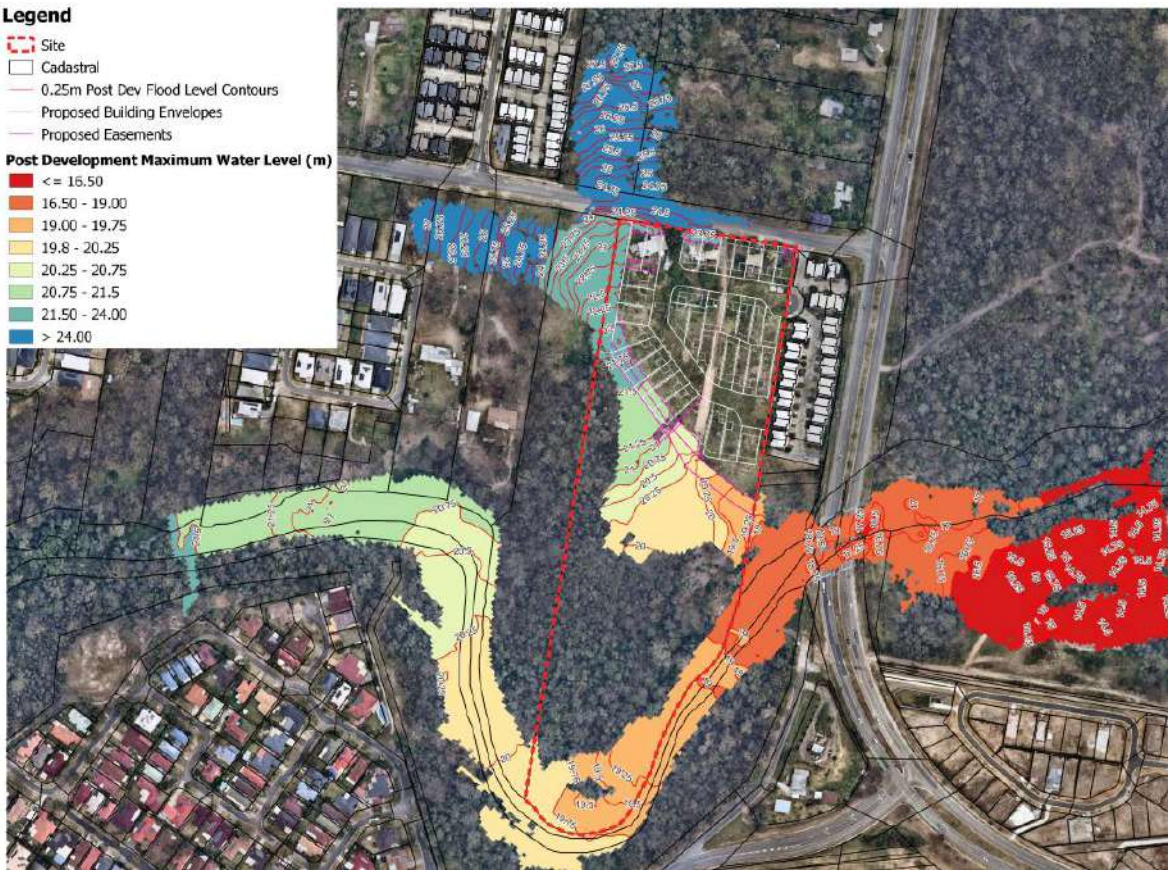

Figure 10: 2% AEP Post Development Flood Levels

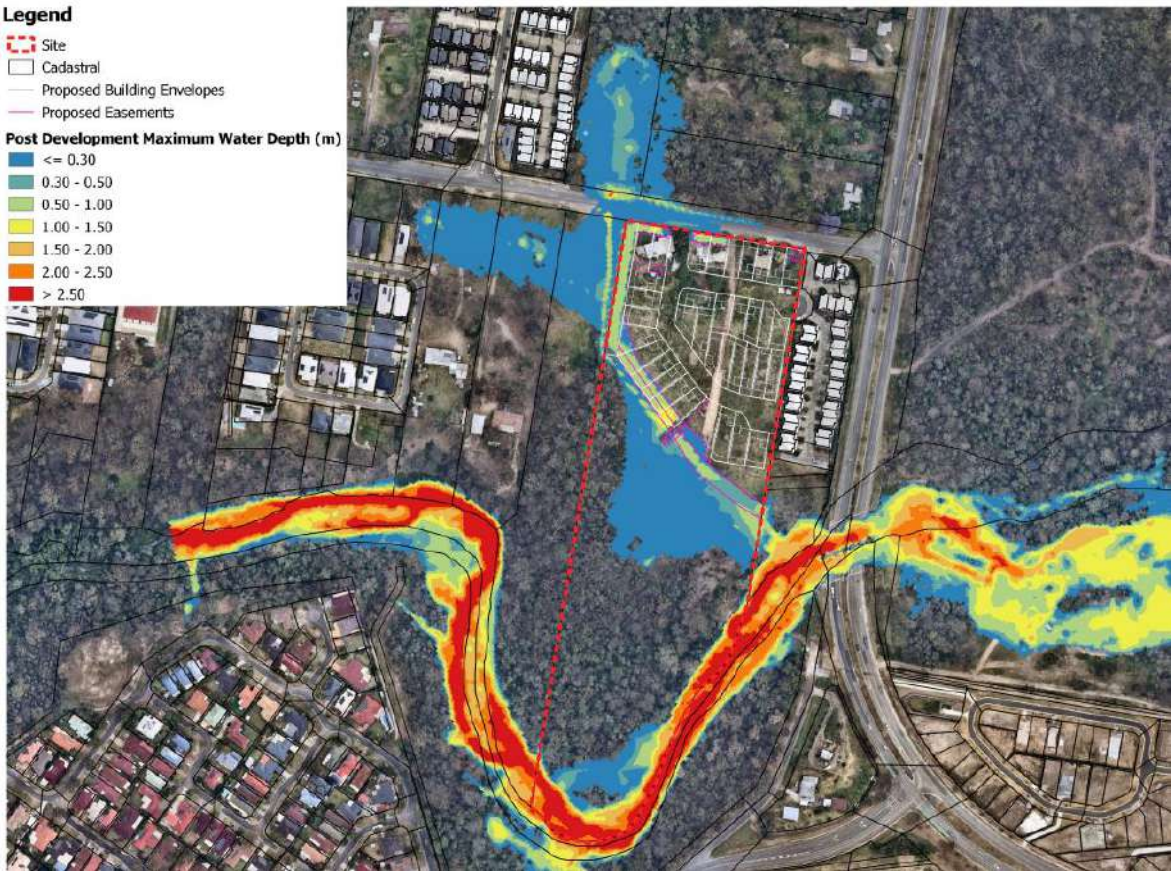

Figure 11: 2% AEP Post Development Flood Depths

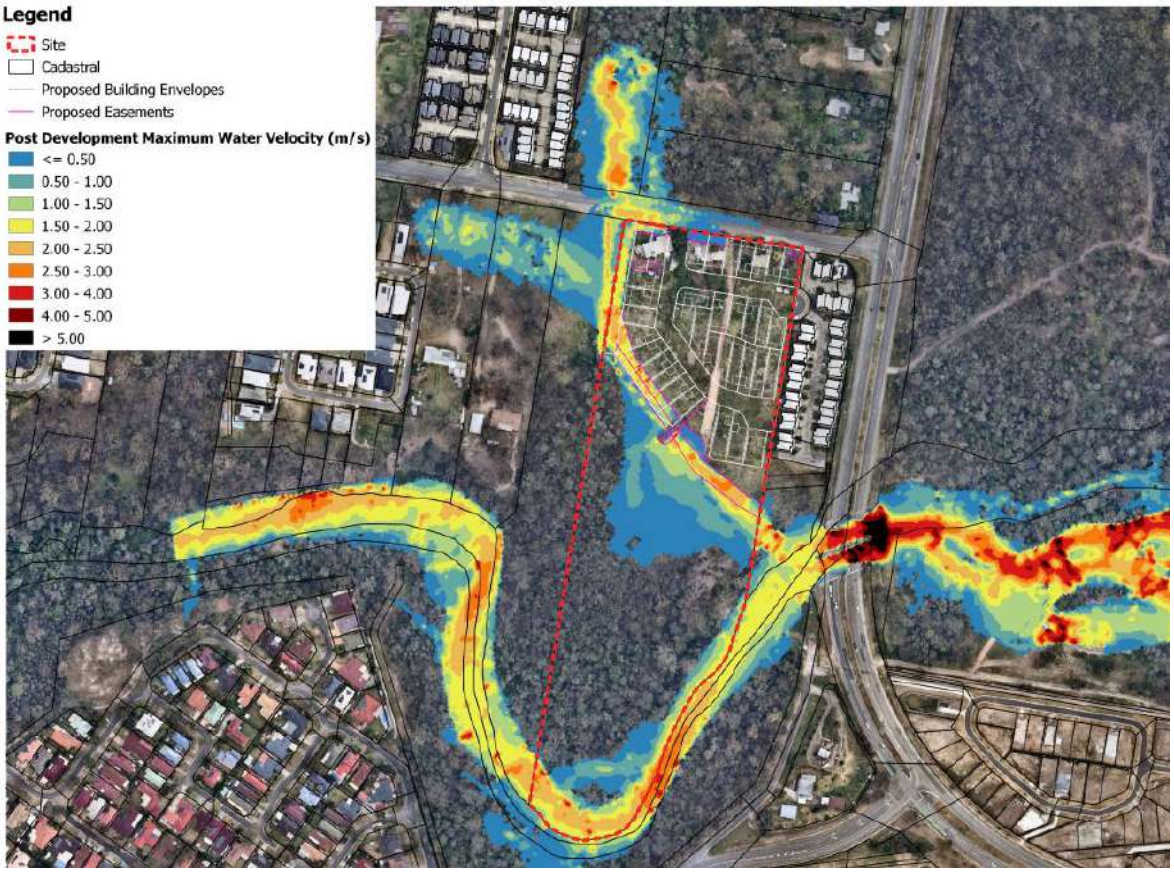

Figure 12: 2% AEP Post Development Flood Velocities

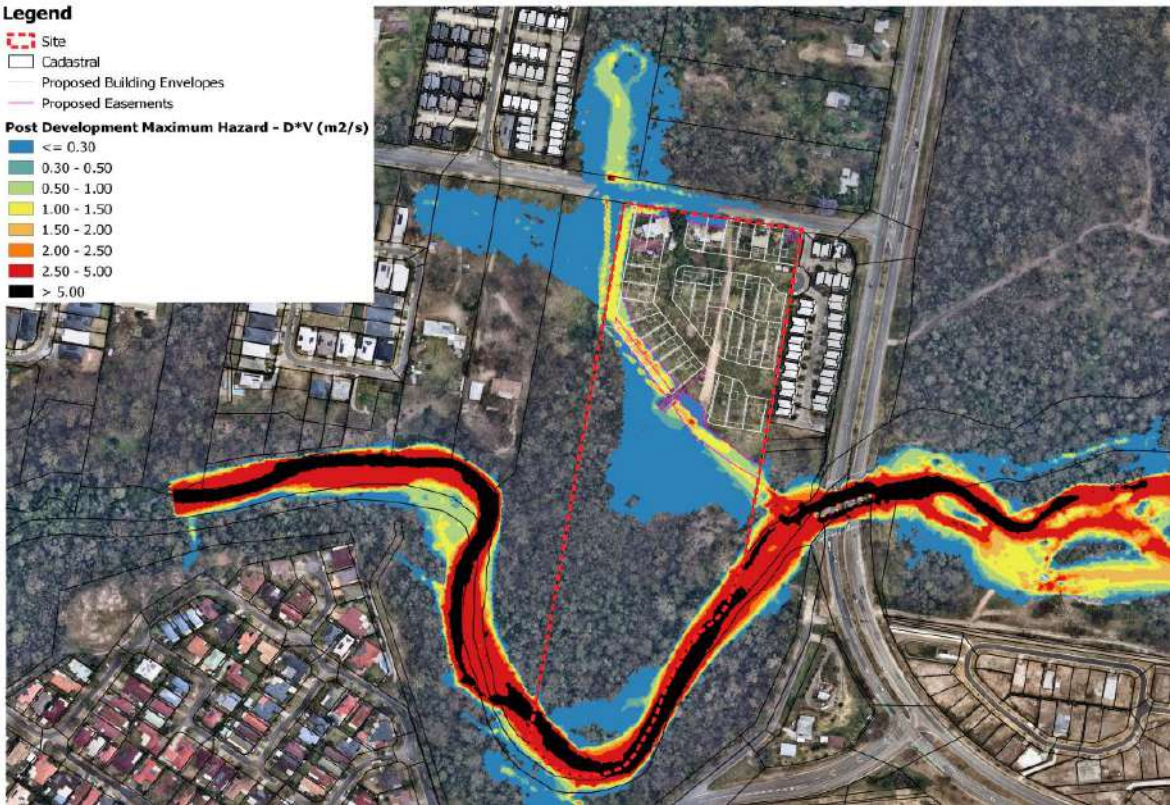

Figure 13: 2% AEP Post Development Hazard (D*V)

The modelling results of the 2% AEP Post development model indicated that the estimated maximum flood levels and depths are less than or comparable to that of the Pre Development scenario external to the subject site. In addition, the majority of the developed site as well as the entirety of the existing eastern townhouse development is projected to be flood free during the 2% AEP flood event. A comparison of flood characteristics between these two scenarios of flood has been presented in the following section.

A graphical representation of the 1 in 50yr ARI (2% AEP) post-development flood levels, depths, velocities and hazard (depth-velocity output) for the model has also been included in Appendix D.

3.1.3 Hydraulic Impact

A comparison between the pre and post-developed maximum water surface levels during the 1 in 50yr ARI (2% AEP) event was generated to graphically assess the potential for hydraulic impact. These graphical representations of the 1 in 50yr ARI (2% AEP) flood afflux maps are presented in Appendix E. These maps present the potential flood level impacts (afflux) caused by the proposed subdivision and required drainage and driveway access infrastructure. There are four (4) different locations which have been summarised below.

Cloverdale Road Reserve

There is a maximum flood level afflux of 0.436m along Cloverdale Road fronting the site occurs for approximately 50m where the location of the proposed vehicle cross over and frontage works are located. The afflux is wholly contained within the Cloverdale Road reserve itself. The majority of the impacts are attributed to change in road levels along this portion – i.e. implementation of site access as well as formalisation of the road reserve from a rural street to an Urban Residential street. The flood depths on Cloverdale Road range from a maximum of 0.482m at the site access to 0.160m on the north-western site boundary. The hazard on the roadway remains below 0.512m^2/s for the site access ensuring site egress is achievable (D*V <0.60m^2/s) in accordance with the BCC Flood Code.

Eastern Waterway Corridor

There is a maximum flood level afflux of 0.127m within the waterway corridor to the east on Lot 0 SP287112 that is located below the existing development and towards Blunder Creek within the High Ecological Significance (HES) area. This area is considered to be undevelopable and the increase in flood level is not anticipated to cause any adverse impacts to the proposed development, existing development or any downstream properties.

Western Waterway Corridor

There is a flood level afflux of 0.130m within the waterway corridor to the west on Lot 100 RP90234, in the north-western corner and along the eastern boundary. The flood level afflux that occurs in the north-western corner is considered to be caused by modelling inaccuracies due to the small isolated area in which the afflux occurs. The flood level afflux that occurs along the eastern boundary is located over the existing natural creek/gully that runs along the eastern boundary of the lot. The afflux is located in the southern portion of the existing channel/waterway corridor which is currently subject to multiple Council overlays including Waterways, Flood, HES, Bio and Koala. As such this area will not be subject to any future development. Given the afflux is only minor, no impacts to the adjacent property are evident.

Internal Waterway Corridor

The hydraulic modelling has estimated areas of flood level afflux within the subject site boundaries, however these areas are within the areas with no proposed development. The results have also estimated a large area internal and external to the site that will no longer be inundated during the 2% AEP overland flow event. This area includes the existing townhouse development to the east which will no longer experience inundation during the 2% AEP overland flow flood event. This is considered to be a beneficial outcome for both the proposed development and Council as the current overland flow flooding conditions that the existing townhouse site experiences may have been overlooked in the original development application for the site.

Therefore, the areas of flood level afflux shown within the afflux plot in Appendix E, are not anticipated to cause any adverse impacts to any nearby existing development or downstream properties and are to be considered in conjunction with the significant overland flow flood extent reduction.

3.1.4 Sensitivity Analysis

The BCC information request (A006067610) dated 6 September 2022 requested that a sensitivity analysis was undertaken with fully developed upstream catchments and an increased Mannings value of 0.10 for any vegetated/open space areas. The sensitivity analysis was requested to be used to assist in setting lot levels and grading the internal road reserve with the results show in Appendix F.

The internal lot and road levels were set by using the maximum of the water levels in the sensitivity analysis or the post development flood levels with an additional 500mm freeboard in accordance with the BCC City Plan for Overland Flow. This allowed the finished lot levels to be designed with additional freeboard to ensure that all lots will achieve sufficient flood immunity in accordance with the BCC Flood Overlay Code which is included as Appendix G.

4.0 CONCLUSION

OSKA Civil Consultants have been commissioned by QLD International Investments Pty Ltd to carry out a Hydraulic Impact Assessment (HIA) for a proposed residential subdivision development situated at 12, 18 and 26 Cloverdale Road, Doolandella.

This Hydraulic Impact Assessment (HIA) was prepared to provide a conceptual estimate of any potential impact due to the proposed development.

The results of the analysis have determined that:

- An XP-SWMM model was constructed to undertake a hydraulic assessment for the site, the proposed development and its surrounding areas.
- The existing flood regime has been presented within this report.
- The proposed drainage infrastructure along with the required driveway access road (front and rear) discussed within this report has been implemented into the post-development model.
- The proposed driveway provides a safe trafficable driveway during the 2% AEP event;
- The existing townhouse development to the east is no longer inundated during the 2% AEP overland flow event.
- The site's proposed development and topographical alterations will not cause any meaningful actionable nuisance external to the site, with three small area of afflux in flood levels external to the site. There are areas within the site where afflux in flood levels occur, however the location of these affluxes is tolerable. It has been determined that the areas of afflux are within undevelopable areas or considered to be model inaccuracies and are not anticipated to cause any adverse impacts to the existing developments/properties or downstream properties.
- The proposed development is to comply with BCC's Flood Overlay Code.

APPENDIX

A

TERRAMAP
Contour and Detail Survey
(Ref: 3814/002-3 Rev 2)